

# **STUDY PACKAGE**

## **REASONING**

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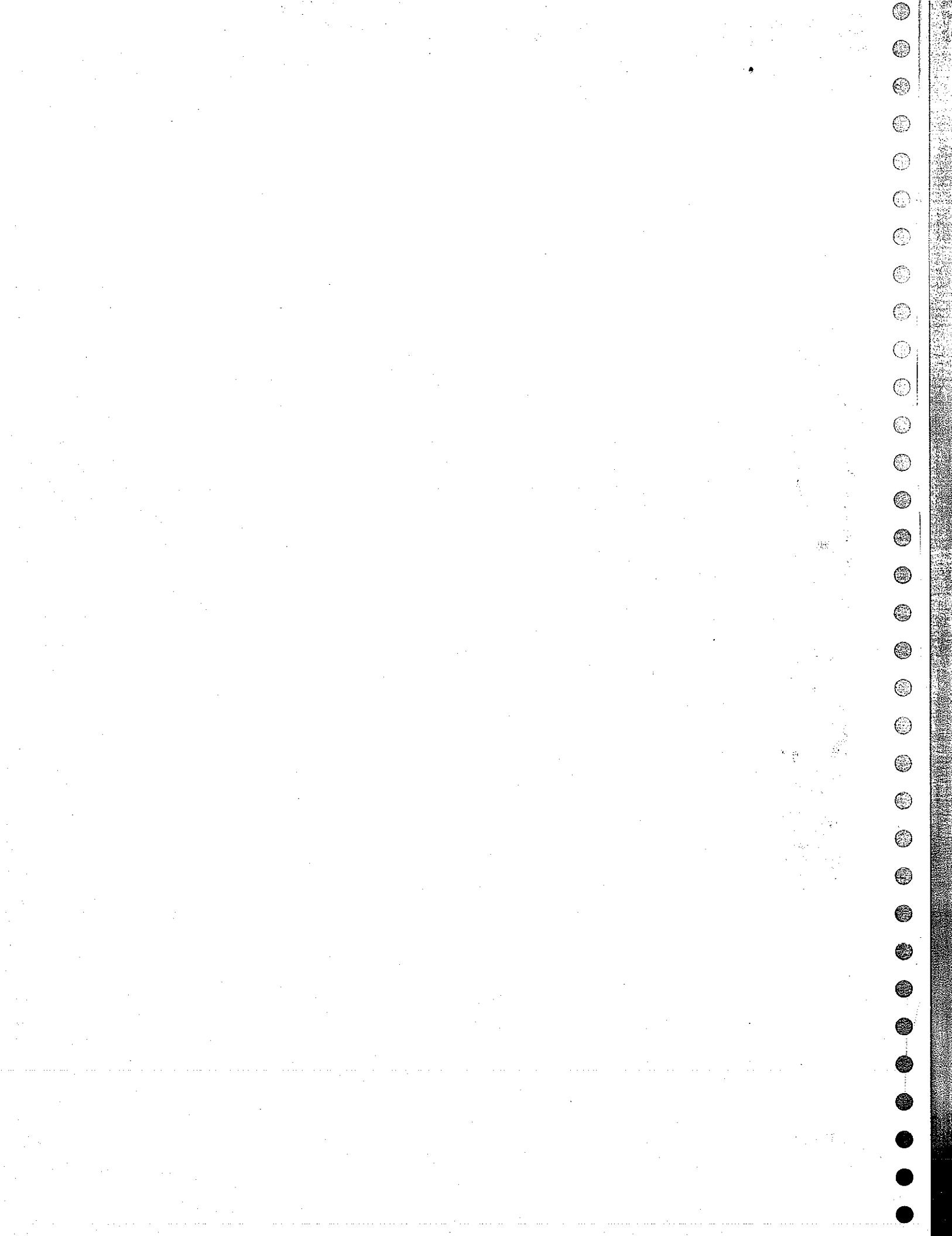
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# SECTION III INTELLIGENCE AND CRITICAL REASONING



## ANALOGY

'Analogy' means 'Similarity'. In this type of questions, two objects related in some way are given and another similar relationship has to be identified.

**Types of questions :**

(i) \_\_\_\_\_ : \_\_\_\_\_ :: \_\_\_\_\_ : ?  
I II III IV

In this type, objects I and II, related in some way, are given and object III is also given. We have to find out object IV from the alternative provided which bears the same relationship with the object III as objects I and II are related.

(ii) \_\_\_\_\_ : \_\_\_\_\_ :: ? : ?  
I II III IV

In this type, we have to find the pair of objects as objects III & IV which bears the same relationship as objects I & II are related.

### 1. ANTONYM RELATIONSHIP:

**Example 1 :**

Deep : Shallow :: Freedom : .....

- (a) Democracy (b) Convict  
(c) Prison (d) Discipline

**Solution :**

(d) 'DEEP' is the antonym of 'SHALLOW' while 'Freedom' is the antonym of 'Discipline'.

**Some more examples are given below :**

Best : Worst	Save : Kill
Initial : Final	Lend : Borrow
Import : Export	Zenith : Nadir
Dawn : Dusk	Flood : Femine
Advance : Retreat	Cruel : Kind
Ignore : Notice	Create : Destroy
Sink : Float	Mourn : Rejoice

### 2. SYNONYM RELATION:

**Example 2 :**

Genuine : Authentic :: Mirage : ?  
(a) Image (b) Transpiration  
(c) Reflection (d) Illusion

**Solution :**

(d) First is made from the second.

**Some more examples are given below :**

Vacant : Empty	Tempest : Storm
Admire : Praise	Stable : Rigid
Ban : Prohibition	Dearth : Scarcity
Abduct : Kidnap	Blend : Mix
Brim : Edge	Fallacy : Illusion

### 3. QUANTITY AND UNIT:

**Example 3 :**

Volume : Litre :: Area : .....

- (a) Hectare (b) Degree  
(c) Radian (d) Newton

**Solution :**

- (a) Area : Hectare

**Some more examples are given below :**

Force : Newton	Temperature : Degree
Power : Watt	Energy : Joule
Mass : Kilogram	Pressure : Pascal
Current : Ampere	Time : Second
Angle : Radian	Length : Metre
Frequency : Hertz	

### 4. INDIVIDUAL AND GROUP/CLASS:

**Example 4 :**

Moon : Satellite :: Earth : ?

- (a) Sun (b) Planet  
(c) Solar system (d) Asteroid

**Solution :**

(b) Moon is a satellite and Earth is a planet.

**Some more examples are given below :**

Man : Crowd	Flowers : Bouquet
Fish : Shoal	Sheep : Flock
Cattle : Herd	Singer : Chorus
Soldiers : Army	Artist : Troupe

### 5. PRODUCT AND RAW MATERIAL:

**Example 5 :**

Candle : Wax :: Paper : ?

- (a) Wood (b) Tree  
(c) Bamboo (d) Pulp

**Solution :**

(d) First is made from the second.

**Some more examples are given below :**

Metal : Ore	Bread : Flour
Curd : Milk	Wine : Grapes
Butter : Milk	Wall : Brick
Furniture : Wood	Pullover : Wool
Fabric : Yarn	Book : Paper
Cloth : Fibre	Oil : Seed
Shoes : Leather	Metal : Ore
Ketchup : Tomato	Marmalade : Orange

## 6. TROPHY AND GAME:

**Example 6 :**

- Wimbledon Trophy : Tennis :: Walker's Cup : ?  
 (a) Hockey                   (b) Polo  
 (c) Golf                      (d) Wrestling

**Solution :**

- (c) Walker's Cup : Golf

**Some more examples are given below :**

- Ranji Trophy : Cricket  
 Dhyan Chand Trophy : Hockey  
 Thomas Cup : Badminton  
 Uber cup : Badminton  
 Azlan Shah Trophy : Hockey

## 7. WORKER AND WORKING PLACE

**Example 7 :**

- Doctor : Hospital :: Teacher : ...  
 (a) Office                   (b) School  
 (c) House                   (d) Field

**Solution :**

- (b) Teacher : School

**Some more examples are given below :**

Lawyer : Court	Farmer : Field
Pilot : Cockpit	Chef : Kitchen
Artist : Theatre	Sailor : Ship
Servant : House	Engineer : Site
Scientist : Laboratory	Clerk : Office
Painter : Gallery	Waiter : Restaurant
Gambler : Casino	

## 8. WORKER AND PRODUCT

**Example 8 :**

- Producer : Film :: Author : .....  
 (a) Food                   (b) Newspaper  
 (c) Book                   (d) Poem

**Solution :**

- (c) Author : Book

**Some more examples are given below :**

Tailor : Dress	Farmer : Crop
Cobbler : Shoes	Goldsmith : Ornaments
Carpenter : Furniture	Editor : Newspaper
Poet : Poem	Chef : Food

## 9. TOOL AND WORKER

**Example 9 :**

- Pen : Author :: Sword : .....  
 (a) Carpenter              (b) Warrior  
 (c) Tailor                 (d) Farmer

**Solution :**

- (b) Sword : Warrior

**Some more examples are given below :**

Gun : Soldier	Saw : Carpenter
Harrow : Gardener	Axe : Woodcutter
Chisel : Sculptor	Needle : Tailor
Knife : Chef	Stethoscope : Doctor
Plough : Farmer	Anvil : Blacksmith
Brush : Painter	Scissors : Barber
Telescope : Astronomer	

## 10. ORGAN AND DISEASE

**Example 10 :**

- Eye : Myopia :: Teeth : ?  
 (a) Pyorrhoea              (b) Cataract  
 (c) Trachoma              (d) Eczema

**Solution :**

- (a) Second is a disease of the first.

**Some more examples are given below :**

Liver : Jaundice
Eye : Cataract
Kidney : Stone

## 11. CAPITAL AND COUNTRY

**Example 11 :**

- Ottawa : Canada :: Canberra : ?  
 (a) Argentina              (b) Switzerland  
 (c) Sri Lanka              (d) Australia

**Solution :**

- (d) Ottawa is the capital of Canada and Canberra is the capital of Australia.

**Some more examples are given below :**

Rome : Italy	Muskat : Oman
Lima : Peru	Accra : Ghana
Oslo : Norway	Delhi : India
New York : USA	Mexico City : Mexico

## 12. CAUSE AND EFFECT

**Example 12 :**

- Race : Fatigue :: Fast : .....  
 (a) Hunger                (b) Sleep  
 (c) Energy                (d) Disease

**Solution :**

**ANALOGY****Some more examples are given below :**

- |               |                     |
|---------------|---------------------|
| Shoot : Skill | Infection : Disease |
| Food : Energy |                     |

**13. INSTRUMENT AND MEASUREMENT****Example 13 :**

- Scale : Length :: Odometer : \_\_\_\_\_
- (a) Temperature      (b) Current  
 (c) Speed              (d) Rain

**Solution :**

- (c) Odometer : Speed

**Some more examples are given below :**

- Thermometer : Temperature  
 Hygrometer : Humidity  
 Ammeter : Current  
 Seismograph : Earthquake

**14. MALE AND FEMALE****Example 14 :**

- Son : Daughter :: Nephew : \_\_\_\_\_
- (a) Girl              (b) Lady  
 (c) Cousin            (d) Niece

**Solution :**

- (d) Nephew : Niece

**Some more examples are given below :**

- Lion : Lioness          Duck : Drake  
 Boy : Girl              Dog : Bitch  
 Bull : Cow              Gentleman : Lady

**15. STUDY AND TOPIC****Example 15 :**

- Virology : Virus :: Entomology : \_\_\_\_\_
- (a) Insects            (b) Animals  
 (c) Fungi             (d) Fishes

**Solution :**

- (a) Entomology : Insects

**Some more examples are given below :**

- |                           |                     |
|---------------------------|---------------------|
| Botany : Plants           | Zoology : Animals   |
| Mycology : Fungi          | Phycology : Algae   |
| Ichthyology : Fishes      | Histology : Tissues |
| Astronomy : Planets       | Astrology : Future  |
| Taxonomy : Classification | Pathology : Disease |
| Haematology : Blood       | Pedology : Soil     |
| Anthropology : Man        | Cardiology : Heart  |
| Palaeography : Writings   |                     |

**16. TOOL AND ACTION****Example 16 :**

- Pen : Write :: Gun : \_\_\_\_\_
- (a) Dig              (b) Shoot  
 (c) Cut              (d) Guard

**Solution :**

- (b) Gun : Shoot

**Some more examples are given below :**

- |                       |                  |
|-----------------------|------------------|
| Loudspeaker : Amplify |                  |
| Microscope : Magnify  |                  |
| Filter : Purify       | Spoon : Feed     |
| Sheild : Guard        | Steering : Drive |

**17. WORD AND INTENSITY****Example 17 :**

- Quarrel : War :: Unhappy : \_\_\_\_\_
- (a) Happy            (b) Sad  
 (c) Refuse           (d) Deny

**Solution :**

- (b) Unhappy : Sad

**Some more examples are given below :**

- |                   |                |
|-------------------|----------------|
| Crime : Sin       | Refuse : Deny  |
| Famous : Renowned | Sink : Drown   |
| Wish : Desire     | Moist : Drench |

**18. SYMBOLIC RELATIONSHIP****Example 18 :**

- Redcross : Hospital :: Red : \_\_\_\_\_
- (a) Roses            (b) Danger  
 (c) Blood           (d) None of these

**Solution :**

- (b) Red : Danger

**Some more examples are given below :**

- |                          |                |
|--------------------------|----------------|
| Degree : Knowledge       | Stars : Rank   |
| Mace : Majesty           | Black : Sorrow |
| Green : Clear            |                |
| Victoria cross : Bravery |                |
| Crown : Monarchy         |                |

**19. HISTORICAL BUILDING AND PLACE****Example 19 :**

- Red Fort : Delhi :: Golden Temple : \_\_\_\_\_
- (a) Agra            (b) Amritsar  
 (c) Jama Masjid    (d) Taj Mahal

**Solution :**

- (b) Golden Temple : Amritsar

**Some more examples are given below :**

- |                          |                     |
|--------------------------|---------------------|
| Taj Mahal : Agra         | Qutub Minar : Delhi |
| Rock Garden : Chandigarh |                     |
| Sun Temple : Orissa      | Jama Masjid : Delhi |

## EXERCISE

**DIRECTIONS :** In each of the following questions, there are two words / set of letters / numbers to the left of the sign :: which are connected in some way. The same relationship obtains between the third words / set of letters / numbers and one of the four alternatives under it. Find the correct alternative in each question.

1. Flying : Bird :: Creeping : ?
  - (a) Aeroplane
  - (b) Snail
  - (c) Ground
  - (d) Flower
2. Clock : Time :: Thermometer : ?
  - (a) Heat
  - (b) Radiation
  - (c) Energy
  - (d) Temperature
3. Man : Walk :: Fish : ?
  - (a) Swim
  - (b) Eat
  - (c) Live
  - (d) Sleep
4. Import : Export :: Expenditure : ?
  - (a) Deficit
  - (b) Income
  - (c) Debt
  - (d) Tax
5. Ocean : Water :: Glacier : ?
  - (a) Refrigerator
  - (b) Ice
  - (c) Mountain
  - (d) Cave
6. PRLN : XZTV :: JLFH : ?
  - (a) NPRT
  - (b) NRPT
  - (c) NTRP
  - (d) RTNP
7. DRIVEN : EIDRVN :: BEGUM : ?
  - (a) EUBGM
  - (b) MGBEU
  - (c) BGMEU
  - (d) UEBGM
8. 14 : 9 :: 26 : ?
  - (a) 12
  - (b) 13
  - (c) 15
  - (d) 31
9. ACFJ : OUZJ :: SUXB : ?
  - (a) GNSA
  - (b) GLQZ
  - (c) GKPY
  - (d) GMRB
10. ?4 :: 5 : ?
  - (a) 23
  - (b) 22
  - (c) 26
  - (d) 20
11. Medicine : Sickness :: Book : ?
  - (a) Ignorance
  - (b) Knowledge
  - (c) Author
  - (d) Teacher
12. Bank : River :: Coast : ?
  - (a) Flood
  - (b) Waves
  - (c) Sea
  - (d) Beach
13. Supervisor : Worker :: ?
  - (a) Junior : Senior
  - (b) Elder : Younger
  - (c) Debtor : Creditor
  - (d) Officer : Clerk
14. Thunder : Rain :: Night : ?
  - (a) Day
  - (b) Dusk
  - (c) Darkness
  - (d) Evening
15. ACE : HIL :: MOQ : ?
  - (a) XVT
  - (b) TVX
  - (c) VTX
  - (d) TUX
16. NUMBER : UNBMER :: GHOST : ?
  - (a) HOGST
  - (b) HOGTS
  - (c) HGOST
  - (d) HGSOT
17. 11 : 17 :: 19 : ?
  - (a) 29
  - (b) 27
  - (c) 23
  - (d) 21
18. Court : Justice :: School : ?
  - (a) Teacher
  - (b) Student
  - (c) Ignorance
  - (d) Education
19. Breeze : Cyclone :: Drizzle : ?
  - (a) Earthquake
  - (b) Storm
  - (c) Flood
  - (d) Downpour
20. Oxygen : Burn :: Carbon dioxide : ?
  - (a) Isolate
  - (b) Foam
  - (c) Extinguish
  - (d) Explode
21. Teheran : Iran :: Beijing : ?
  - (a) China
  - (b) Japan
  - (c) Turkey
  - (d) Malaysia
22. 3 : 27 :: 4 : ?
  - (a) 140
  - (b) 75
  - (c) 100
  - (d) 64
23. Disease : Pathology :: Planet : ?
  - (a) Astrology
  - (b) Geology
  - (c) Astronomy
  - (d) Palaeontology
24. Foresight : Anticipation :: Insomnia : ?
  - (a) Treatment
  - (b) Disease
  - (c) Sleeplessness
  - (d) Unrest
25. CG : EI :: FJ : ...
  - (a) LM
  - (b) IJ
  - (c) GK
  - (d) HL
26. Ocean : Pacific :: Island : ?
  - (a) Greenland
  - (b) Ireland
  - (c) Netherland
  - (d) Borneo
27. Tuberculosis : Lungs :: Cataract : ?
  - (a) Ear
  - (b) Throat
  - (c) Skin
  - (d) Eye
28. Oasis : Sand :: Island : ?
  - (a) River
  - (b) Sea
  - (c) Water
  - (d) Waves
29. Major : Battalion :: Colonel : ?
  - (a) Company
  - (b) Regiment
  - (c) Army
  - (d) Soldiers
30. Shout : Whisper :: Run : ?
  - (a) Stay
  - (b) Stand
  - (c) Walk
  - (d) Up

**ANALOGY**

31. TOMATO : MTOOTA :: 123412 : ?  
 (a) 312214      (b) 123456  
 (c) 321124      (d) 213314
32. 12 : 30 :: 20 : ?  
 (a) 25      (b) 32  
 (c) 35      (d) 42
33. 3 : 10 :: 8, ?  
 (a) 10      (b) 13  
 (c) 14      (d) 17
34. 13 : 19 :: ? : 31  
 (a) 21      (b) 23  
 (c) 25      (d) 26
35. 48 : 122 :: 168 : ?  
 (a) 284      (b) 286  
 (c) 288      (d) 290
36. TSR : FED :: WVU ?  
 (a) CAB      (b) MLK  
 (c) PQS      (d) GFH
37. CJDL : FMGR :: IKJR : ?  
 (a) OQPT      (b) RSTU  
 (c) LSNT      (d) KRMO
38. BCDA : STUR :: KLMJ : ?  
 (a) VWXU      (b) EFHG  
 (c) SRTU      (d) QSRP
39. ACBD : EFGH :: OQPR -  
 (a) STUV      (b) RSTU  
 (c) UVWX      (d) QRST
40. CEG : EGC :: LNP :  
 (a) LPN      (b) UWY  
 (c) NPL      (d) MOP
41. A : X :: B : .....  
 (a) W      (b) V  
 (c) Y      (d) Z
42. E : V :: I : .....  
 (a) Q      (b) R  
 (c) S      (d) T
43. KLM : PON :: NOP : .....  
 (a) LMK      (b) MLK  
 (c) NML      (d) KLN
44. ACE : FGH :: LNP : ?  
 (a) QRS      (b) PQR  
 (c) QST      (d) MOQ
45. 211 : 333 :: 356 : ?  
 (a) 358      (b) 359  
 (c) 423      (d) 388
46. Wine : Grapes :: Vodks : ?  
 (a) Apple      (b) Potatoes  
 (c) Oranges    (d) Flour

**DIRECTIONS:** In each of the following questions, a pair of words is given, followed by four pairs of words as alternatives. Choose the correct pair in which the words bears the same relationship to each other as the words of the given pair bear.

47. Teeth : Chew ::  
 (a) Mind : Think      (b) Sweater : Heat  
 (c) Food : Taste      (d) Eyes : Flicker
48. Eyes : Tears ::  
 (a) Sea : Water      (b) Volcano : Lava  
 (c) Heart : Artery    (d) Hunger : Bread
49. Lawn : Grass ::  
 (a) Wool : Sheep      (b) Skin : Goat  
 (c) Pelt : Fur        (d) Rice : Farm
50. Telephone : Ring :: ..... : .....
- (a) Door : knock      (b) Gate : open  
 (c) Door : wood      (d) Lock : key
51. Always : Never ::  
 (a) Often : Rarely  
 (b) Frequently : Normally  
 (c) Constantly : Frequently  
 (d) Intermittently : Casually
52. Insult : Humiliate ::  
 (a) Shoot : Kill      (b) Abuse : Disrespect  
 (c) Dog : Bark        (d) Injury : Pungent
53. Soldier : Regiment :: ?  
 (a) Wheels : Bearings (b) Coil : Motor  
 (c) Book : Printer    (d) Nitrogen : Gas
54. Zephyr : Gale ::  
 (a) Imprint : Emboss (b) Gust : Gusset  
 (c) Trickle : Torrent (d) Decay : Rot
55. Seldom : Rarely ::  
 (a) Frequent : Infrequently  
 (b) Often : Usually  
 (c) Collectively : Selectively  
 (d) Tantamount : Equivalent
56. Stag : Deer ::  
 (a) Otter : Ostrich    (b) Ox : Bull  
 (c) Mare : Horse     (d) Bull : Cow
57. Spinster : Bachelor ::  
 (a) Kingfisher : Hedgehog  
 (b) Rooster : Chicken  
 (c) Fox : Vixen  
 (d) Cow : Bull
58. Dawn : Twilight ::  
 (a) Night : Day       (b) Nine : Ninety  
 (c) Prologue : Epilogue (d) Day : Evening
59. PS : DG ::  
 (a) CE : TR           (b) KM : OQ  
 (c) EU : TW           (d) FU : KU

60. Miami : Florida ::  
 (a) Albany : New York  
 (b) Chicago : Albany  
 (c) South America : Sydney  
 (d) Chicago : USA
61. Volcano : Lava ::  
 (a) Fault : Earthquake  
 (b) Death : Sorrow  
 (c) Delta : River  
 (d) Rock : Sand
62. Shoe : Leather :: ..... : .....
63. Dinosaur : Dragon :: ..... : .....
64. Ink : Paper ::  
 (a) Pen : Pencil      (b) Paint : Painting  
 (c) Chalk : Blackboard (d) Carbon paper : Ballpoint pen
65. 'Driving' is related to 'bus' in the same way as 'flying' is related to  
 (a) air                (b) kite  
 (c) bird               (d) aeroplane
66. 'Chapter' is related to 'Book' in the same way as 'brick' is related to  
 (a) heap              (b) building  
 (c) clay               (d) mason
67. 'Water' is related to 'Ocean' in the same way, as 'snow' is related to .....?  
 (a) Peaks             (b) Hail  
 (c) Glacier           (d) Mountain
68. 'JKLM' is related to 'XYZA' in the same way as 'NOPQ' is related to  
 (a) RSTU             (b) YZAB  
 (c) DEFG             (d) BCDE
69. Find out the alternative whose two words have the same relation as in the two words given in question.  
 Bunch : Key ::  
 (a) Hound : Pack     (b) Team : Competition  
 (c) Beehive : Bee    (d) Bouquet : Flower
70. 'Hygrometer' is related to 'Humidity' in the same way as 'Sphygmomanometer' is related to  
 (a) Pressure          (b) Blood Pressure  
 (c) Precipitation    (d) Heart Beat
71. 'Engineer' is related to 'Machine' in the same way as 'Doctor' is related to  
 (a) Hospital          (b) Body  
 (c) Disease           (d) Medicine
72. 'Charminar' is related to 'India' in the same way as Sphinx is related to  
 (a) England           (b) Canada  
 (c) Egypt             (d) Vatican

## SOLUTIONS

1. (b) As 'Bird' flies, in the same way, 'snails' creeps.
2. (d) First is an instrument to measure the second.
3. (a) As a man covers some distance after walking, in the same way, a fish covers some distance after swimming.  
 Hence the correct answer is (a).
4. (b) The words in each pair are antonyms.
5. (b) First consists of the second.
6. (d) As               Similarly,
- $P \xrightarrow{+8} X$        $J \xrightarrow{+8} R$
- $R \xrightarrow{+8} Z$        $L \xrightarrow{+8} T$
- $L \xrightarrow{+8} T$        $F \xrightarrow{+8} N$
- $N \xrightarrow{+8} V$        $H \xrightarrow{+8} P$
7. (b) Fifth and third letters of the first term are first and second letters of the second term and first two letters of the first term are third and fourth letters of the second term.
8. (c) The relationship is  $(2x - 4) : x$ .
9. (d) As,              Similarly,
- $A \xrightarrow{+14} O$        $S \xrightarrow{+14} G$
- $C \xrightarrow{+18} U$        $U \xrightarrow{+18} M$
- $F \xrightarrow{+20} Z$        $X \xrightarrow{+20} R$
- $J \xrightarrow{+0} J$        $B \xrightarrow{+0} B$
10. (d) Second term =  $4 \times$  First term  
 $\therefore$  Fourth term =  $4 \times$  Third term
11. (a) As medicine cures sickness, in the same way, books

**ANALOGY**

12. (c) Bank is the land beside a river.  
Similarly, coast is the land beside a sea.
13. (d) As supervisor supervises the worker, in the same way, officer supervises the clerk.
14. (c) As 'Rain' is followed by 'Thunder', similarly 'Darkness' is followed by 'Night'.
15. (d) As,                      Similarly,  

$$\begin{array}{ccc} A & \xrightarrow{+7} & H \\ C & \xrightarrow{+6} & T \\ E & \xrightarrow{+7} & L \end{array}$$

$$\begin{array}{ccc} M & \xrightarrow{+7} & T \\ M & \xrightarrow{+6} & U \\ Q & \xrightarrow{+7} & X \end{array}$$
16. (d) First two letters of the first term are in reverse order in the second term and so are the next two letters.
17. (a)  $11 : 17$  alternate prime number (skipping 13)  $19 : 29$  alternate prime number (skipping 23)
18. (d) First is the place where the second is imparted.
19. (d) Second is more intense than the first.
20. (c) 'Oxygen' helps in burning while 'carbon dioxide' extinguishes fire.
21. (a) 'Teheran' is the capital of 'Iran' and 'Beijing' is the capital of 'China'.
22. (d) Second term = (First term)<sup>3</sup>  

$$\therefore$$
 Fourth term = (Third term)<sup>3</sup>
23. (c) Diseases are studied under Pathology.  
Similarly, planets are studied in Astronomy.
24. (c) The words in each pair are synonyms.
25. (d) As,                      Similarly  

$$\begin{array}{ccc} C & \xrightarrow{+2} & E \\ G & \xrightarrow{+2} & I \end{array}$$

$$\begin{array}{ccc} F & \rightarrow & H \\ J & \rightarrow & L \end{array}$$
26. (a) The largest ocean is Pacific Ocean.  
Similarly, the largest island is Greenland.
27. (d) Tuberculosis is a disease of lungs.  
Similarly, Cataract is a disease of eyes.
28. (c) 'Oasis' is a water pool amidst sand.  
Similarly, island is a piece of land amidst water.  
Remember : 'Sea' would have been the answer if we had 'desert' in place of 'sand'.
29. (b) As Major heads a battalion, the Colonel commands a regiment.
30. (c) Whisper is of lesser intense than shouting, so is walking to running.
31. (a) Substitute numbers for letters :  
 $T - 1, O - 2, M - 3$  and  $A - 4$ .
32. (d)  $12 = 3^2 + 3$ ,       $30 = 5^2 + 5$  :  
 $20 = 4^2 + 4$  :       $? = 6^2 + 6$
33. (d)  $3 = 2^2 - 1$ ,       $10 = 3^2 + 1$  :  
 $8 = 3^2 - 1$ ,       $? = 4^2 + 1$
34. (b) 13 and 19 are primes with 17 left out in between.
35. (d)  $48 = 7^2 - 1, 122 = 11^2 + 1$  :  
 $168 = 13^2 - 1, ? = 17^2 + 1$
36. (b) The letters are consecutive and written in reverse order.
37. (c) In each set of letters, the 1st and 3rd letters are consecutive.
- $\boxed{C} \boxed{J} \boxed{D} \boxed{L} : \boxed{F} \boxed{M} \boxed{G} \boxed{R} :: \boxed{I} \boxed{K} \boxed{J} \boxed{R} : \boxed{L} \boxed{S} \boxed{N} \boxed{T}$
38. (a) In each group the first three letters are consecutive and they follows the fourth letter.
- $(\boxed{A} \boxed{B} \boxed{C} \boxed{D}) : (\boxed{S} \boxed{T} \boxed{U} \boxed{R}) :: (\boxed{J} \boxed{K} \boxed{L} \boxed{M}) : (\boxed{U} \boxed{V} \boxed{W} \boxed{X})$
39. (a)  $\begin{array}{cc} \text{A} \xrightarrow{\curvearrowright} \text{B} \xrightarrow{\curvearrowright} \text{C} \xrightarrow{\curvearrowright} \text{D} & \text{O} \xrightarrow{\curvearrowright} \text{P} \xrightarrow{\curvearrowright} \text{Q} \xrightarrow{\curvearrowright} \text{R} \\ \text{E} \xrightarrow{\curvearrowright} \text{F} \xrightarrow{\curvearrowright} \text{G} \xrightarrow{\curvearrowright} \text{H} & \text{S} \xrightarrow{\curvearrowright} \text{T} \xrightarrow{\curvearrowright} \text{U} \xrightarrow{\curvearrowright} \text{V} \end{array}$   
Here B and D are skipped
40. (c) The second set EGC is formed by simply putting the first letter of CEG at last to form EGC, and so on.
41. (a) If A corresponds to X (the third from the end) then B should correspond to the fourth letter W.
42. (b) The 5th letter from A correspond to 5th from Z and therefore 9th letter 'I' from A would correspond 9th letter 'R' from Z.
43. (b) Because KLM are assigned No. 11, 12 & 13 from A onwards, this corresponds to PON, which are also numbered 11, 12 and 13 from Z to A in reverse order. Hence NOP will correspond to MLK.
44. (a) The three letters moved 5, 4, and 3 and steps forward respectively.
45. (d)  $211 \Rightarrow 2 + 1 + 1 = 4$   
 $333 \Rightarrow 3 + 3 + 3 = 9 \Bigg] + 5$   
Similarly,  
 $356 \Rightarrow 3 + 5 + 6 = 14$   
 $388 \Rightarrow 3 + 8 + 8 = 19 \Bigg] + 5$
46. (b) As Wine is made up by grasp, similarly Vodka is made up by rye or wheat or potatoes .
47. (a) Second is the function of the first.
48. (b) Second comes out of the first.
49. (c) Second grows on the first. "Pelt" is the skin of an animal with the fur or hair still on it.
50. (a) Ring is related to telephone in the same way knock is related to door.
51. (a) The words in each pair are antonyms.
52. (a) Insult results in humiliation as shooting kills.
53. (b) Soldiers form part of a Regiment as coil forms a part of motor. This is part and whole relationship.
54. (c) Zephyr is a milder wind than gale. Trickle is a smaller flow of liquid than torrent.

55. (b) Seldom means not very often. Rarely is more extreme than seldom. Often means quite frequent but usually is more extreme in meaning, i.e. most of the time.
56. (d) Male-Female relationship.
57. (d) Female-Male relationship.
58. (c) Dawn represents beginning of day and twilight represents end of day. Similarly, a prologue comes at the beginning of the book and epilogue at the end of a book.
59. (c) In the both terms, two letters are skipped in between. Similar relationship exists in (c).
60. (a) Miami is in Florida, Albany is in New York.
61. (a) Volcano causes lava to flow. Faulting or displacement of earth's crust causes an earthquake. Both are natural occurrences connected with earth.
62. (b) A shoe is made by attaching different shapes of leather. In the same way a train is constituted by a number of wagons.
63. (c) Dinosaur and dragon belong to the same category. In the same way snow and ice fall in the same category.
64. (c) Ink is used to write on paper and chalk is used to write on blackboard.
65. (d) As 'Bus' — a vehicle is used in driving, in the same way, 'Aeroplane' — a vehicle is used in flying.
66. (b) As 'Chapter' is a part of a 'Book', in the same way, 'brick' is a part of a 'Building'.
67. (c) 'Ocean' is a moving body of 'water'. Similarly, 'glacier' is a moving body of 'snow'.
68. (d) Each letter of JKLM stands for each corresponding letter of XYZA, 14 places before.
69. (d) As 'Bunch' is the collection of 'Keys', in the same way, Bouquet is the collection of 'Flowers'.
70. (b) First is an instrument to measure the second.
71. (c) First tackles the second.
72. (c) Charminar is situated in India. Similarly, Sphinx is a monument of Egypt.

## 2 CHAPTER

# CLASSIFICATION OR ODD ONE OUT

In this type of questions, all the options except one are belonging to same category. We have to identify which one is different from the rest.

There may be several kinds of relationship between given options. For example.

1. Relationship based on meaning.
2. Functional relationship.
3. Word/number formation relationship.
4. Even, odd or prime number relationship.
5. Divisibility or non-divisibility by a certain number.
6. Repetition of certain digits/alphabets in the group.

#### Example 1 :

Find out the odd one out.

- (a) 28                      (b) 14  
(c) 49                      (d) 64

#### Solution :

- (d) Except 64, all the rest number 28, 14 and 49 are divisible by 7 while 64 is not divisible by 7. Therefore 64 is different from the rest.

#### Example 2 :

Which one is different from the rest three ?

- (a) Door                      (b) Gate  
(c) Table                      (d) Window

#### Solution :

- (c) All the rest are the parts of a building.

#### Example 3 :

Find out the odd one out.

- (a) Japan                      (b) Nepal  
(c) France                      (d) China

#### Solution :

- (c) All the rest are the countries of Asia.

#### Example 4 :

Which one is different from the rest three?

- (a) NMLK                      (b) RQPO  
(c) UTSR                      (d) WXUV

#### Solution :

- (d) In all the other options, the letters are in reverse order of alphabet.

#### Example 5 :

Which one letter group differs from the other three?

- (a) WRONG                      (b) GREEN  
(c) WHITE                      (d) RIGHT

#### Solution :

- (b) In other options, no letter is repeated.

#### Example 6 :

Three of the following are alike in a certain way and form a group. Find the odd one out.

- (a) Bird                              (b) Insect  
(c) Aeroplane                      (d) Kite

#### Solution :

- (b) All except the insect fly in the sky.

#### Example 7 :

In this question, there is four words with the letters jumbled up. Three of them are alike. Find the odd one out.

- (a) CIRE                              (b) NAIR  
(c) LOUDSC                              (d) RNUTHDE

#### Solution :

- (a) By arranging the letters of NAIR, LOUDSC and RNUTHDE we get RAIN, CLOUDS and THUNDER respectively which are all related with one other except CIRE i.e. RICE.

## EXERCISE

**DIRECTIONS :** In each of the following questions, four alternatives are given, out of which three are alike in a certain way while one is different. Choose the odd one.

- |                  |                  |                   |                |
|------------------|------------------|-------------------|----------------|
| 1. (a) Jupiter   | (b) Saturn       | 22. (a) 9611      | (b) 7324       |
| (c) Venus        | (d) Sun          | (c) 2690          | (d) 1754       |
| 2. (a) JUDGE     | (b) SCANT        | 23. (a) 19-27     | (b) 16-24      |
| (c) CROWD        | (d) FLUSH        | (c) 15-23         | (d) 13-21      |
| 3. (a) Rose      | (b) Lotus        | 24. (a) Arc       | (b) Diagonal   |
| (c) Marigold     | (d) Lily         | (c) Tangent       | (d) Radius     |
| 4. (a) USTO      | (b) OOT          | 25. (a) Tortoise  | (b) Duck       |
| (c) TTOU         | (d) SST          | (c) snake         | (d) Whale      |
| 5. (a) PUT       | (b) END          | 26. (a) Pineapple | (b) Orange     |
| (c) OWL          | (d) ARM          | (c) Lemon         | (d) Banana     |
| 6. (a) Wood      | (b) Cork         | 27. (a) Hydrogen  | (b) Oxygen     |
| (c) Stone        | (d) Paper        | (c) Iodine        | (d) Nitrogen   |
| 7. (a) FBI       | (b) QMT          | 28. (a) Triger    | (b) Lion       |
| (c) VRY          | (d) HEK          | (c) Fox           | (d) Leopard    |
| 8. (a) BCD       | (b) NPR          | 29. (a) Pen       | (b) Calculator |
| (c) KLM          | (d) PQR          | (c) Pencil        | (d) Ink        |
| 9. (a) CJG       | (b) HNK          | 30. (a) Tree      | (b) Root       |
| (c) ELI          | (d) JQN          | (c) Flower        | (d) Leaf       |
| 10. (a) 248      | (b) 326          | 31. (a) Hour      | (b) Day        |
| (c) 414          | (d) 392          | (c) Second        | (d) Time       |
| 11. (a) Mango    | (b) Apple        | 32. (a) BHE       | (b) DJG        |
| (c) Brinjal      | (d) Grapes       | (c) SYV           | (d) PUS        |
| 12. (a) JOT      | (b) OUT          | 33. (a) 80-9      | (b) 64-8       |
| (c) FED          | (d) DIN          | (c) 36-6          | (d) 7-49       |
| 13. (a) 28       | (b) 65           | 34. (a) Thiamine  | (b) Niacin     |
| (c) 126          | (d) 215          | (c) Trypsin       | (d) Riboflavin |
| 14. (a) 15-12    | (b) 20-10        | 35. (a) 21        | (b) 39         |
| (c) 30-18        | (d) 45-27        | (c) 51            | (d) 83         |
| 15. (a) ABDGK    | (b) CDFIM        | 36. (a) Ladder    | (b) Staircase  |
| (c) BCEHL        | (d) EFGIK        | (c) Bridge        | (d) Escalator  |
| 16. (a) Turmeric | (b) Ginger       | 37. (a) Tailor    | (b) Carpenter  |
| (c) Potato       | (d) Tomato       | (c) Blacksmith    | (d) Barber     |
| 17. (a) KP       | (b) MN           | 38. (a) Kiwi      | (b) Ostrich    |
| (c) HR           | (d) GT           | (c) Eagle         | (d) Penguin    |
| 18. (a) Island   | (b) Coast        | 39. (a) RNJ       | (b) XTP        |
| (c) Harbour      | (d) Oasis        | (c) MIE           | (d) ZWR        |
| 19. (a) TU       | (b) DE           | 40. (a) 22, 4, 5  | (b) 34, 4, 8   |
| (c) MO           | (d) PQ           | (c) 37, 4, 9      | (d) 54, 4, 13  |
| 20. (a) English  | (b) Encyclopedia | 41. (a) Flood     | (b) Hurricane  |
| (c) Russian      | (d) German       | (c) Explosion     | (d) Earthquake |
| 21. (a) VWY      | (b) QRT          | 42. (a) Grams     | (b) Litres     |
| (c) LMO          | (d) JKL          | (c) Tonnes        | (d) Quintals   |
|                  |                  | 43. (a) BAT       | (b) RAT        |
|                  |                  | (c) EAT           | (d) FAT        |

44. (a) FIWE      (b) FLAMEE  
       (c) BUSHDNA    (d) OMAWN
45. (a) NITK      (b) TIK  
       (c) TIH       (d) ITS
46. (a) Venus     (b) Saturn  
       (c) Earth     (d) Mercury
47. (a) Metre     (b) Furlong  
       (c) Acre      (d) Mile
48. (a) Raniganj   (b) Jharia  
       (c) Baroda    (d) Bokaro
49. (a) Nephrology (b) Entomology  
       (c) Astrology   (d) Mycology
50. (a) Faraday   (b) Newton  
       (c) Edison    (d) Beethoven

**DIRECTIONS :** In each of the following questions, four pairs of words are given out of which the words in three pairs bear a certain common relationship. Choose the pair in which the words are differently related.

51. (a) Bottle : Wine      (b) Cup : Tea  
       (c) Pitcher : Water    (d) Ball : Bat
52. (a) Ornithology : Birds  
       (b) Mycology : Fungi  
       (c) Biology : Botany  
       (d) Phycology : Algae
53. (a) Atom : Electron  
       (b) Train : Engine  
       (c) House : Room  
       (d) Curd : Milk

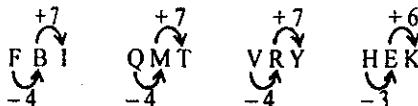
54. (a) Crime : Punishment  
       (b) Judgment : Advocacy  
       (c) Enterprise : Success  
       (d) Exercise : Health
55. (a) Broad : Wide      (b) Light : Heavy  
       (c) Tiny : Small    (d) Big : Large

**DIRECTIONS :** One set of numbers in each of the following questions is different from the rest four that are formed under certain norms. Find the odd set.

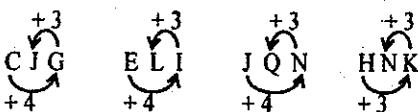
56. (a) 7, 4, 9      (b) 13, 36, 7  
       (c) 5, 25, 9    (d) 11, 16, 7
57. (a) 72, 60      (b) 108, 96  
       (c) 84, 72      (d) 60, 36
58. (a) 12, 8      (b) 6, 16  
       (c) 18, 6      (d) 32, 3
59. (a) 5, 4, 3      (b) 8, 3, 5  
       (c) 7, 5, 6    (d) 6, 5, 4
60. (a) 645      (b) 749  
       (c) 836      (d) 849
61. (a) 001011    (b) 1101011  
       (c) 101101    (d) 100101
62. (a) 3, 4, 8    (b) 6, 2, 9  
       (c) 1, 5, 7    (d) 2, 6, 9
63. (a) 3, 7, 5    (b) 2, 8, 6  
       (c) 7, 9, 5    (d) 3, 8, 2
64. (a) 13, 50, 37 (b) 23, 39, 40  
       (c) 18, 38, 44 (d) 74, 10, 16

## SOLUTIONS

- (d) All the others are planets.
- (a) In other pairs only one vowel is used
- (b) All except Lotus grows on land while lotus grows in water.
- (a) Except USTO, all others have at least one letter repeated.
- (a) All other groups begin with a vowel.
- (c) All the other items are lighter than water, while stone is heavier.
- (d) In each other groups, the first letter is four letters ahead the second letter and the third letter is three letters ahead the first letter.



- (b) All other groups contain three consecutive letters of the alphabet.
- (a) In each other group, the third letter is four letters ahead the first letter and the second letter is three letters ahead the third letter.



10. (d) In all the rest numbers, the third digit is the product of first and second digit.
11. (c) Except 'Brinjal' all the rest are the names of fruits, while 'Brinjal' is the name of a vegetable.
12. (b) This is the only group containing two vowels.
13. (d)  $(3)^3 + 1 = 28$ ,  
 $(4)^3 + 1 = 65$ ,  
 $(5)^3 + 1 = 126$ ,  
 $6^3 + 1 \neq 215$ .
14. (b) In all the rest pairs, the difference is divisible by 3.
15. (d) In all the rest terms, between two consecutive letters 0, 1, 2, and 3 letters are missing respectively.
16. (d) All the rest grow underground.
17. (c) In all other groups, the first letter occupies the same position from A onward as the second letter occupies from Z backward e.g., K is the eleventh letter from the beginning and P is the eleventh letter from the end of the alphabet.
18. (d) All except Oasis are features related to sea while Oasis is related to desert.
19. (c) In all the rest groups the letters are in alphabetic order.
20. (b) All the rest are languages.
21. (d) In all other groups, the first two letters are consecutive and third letter is 2 letters ahead of the second.
22. (b) In all other numbers, the sum of the digits is 17.
23. (b) In all the rest groups there is no common factor of the two numbers.
24. (b) All except Diagonal are terms associated with circle.
25. (d) All except Whale lay eggs.
26. (d) All except Banana are juicy fruits
27. (c) All except Iodine are gases, while Iodine is a liquid
28. (c) All except Fox belong to the cat family.
29. (b) All except Calculator come under the category of writing material.
30. (a) All others are parts of a tree.
31. (d) All the rest are units of time.
32. (d) In all other groups, the third and second letters are 3 steps ahead of the first and third letters respectively.
33. (a) In all other pairs, one number is the square of the other.
34. (c) All except Trypsin are chemical names of vitamins, while trypsin is an enzyme.
35. (d) 83 is the only prime number in the group.
36. (c) All except Bridge are used for up and down movement.
37. (d) All except Barber require raw material to work.
38. (c) All except Eagle are flightless birds.
39. (d) In all other groups, the first and second letters are moved 4 steps backward to obtain second and third letters respectively.
40. (c) In all other groups, the first number is obtained by adding 2 to the product of the second and the third numbers.
41. (c) All except Explosion are natural calamities.
42. (b) All except litre are units or measurement of the mass of a body.
43. (c) BAT, RAT, FAT – all are nouns while EAT is a verb
44. (c) FIWE → WIFE  
FLAMEE → FEMALE  
BUSHDNA → HUSBAND  
OMAWN → WOMAN
45. (b) NITK → KNIT  
TIK → KIT  
TIH → HIT  
ITS → SIT
46. (c) All except Earth denote Roman or Greek Gods and Goddesses.
47. (c) All except Acre are units of measuring distance, while acre is a unit of area.
48. (c) All except Baroda are famous for coal fields.
49. (c) All except Astrology are concerned with biology.
50. (d) All except Beethoven were scientists, while Beethoven was a musician.
51. (d) In all other pairs, first is used to hold the second.
52. (c) In all other pairs, first is the study of second.
53. (d) In all other pairs, second is a part of the first.
54. (b) In all other pairs, second is the result of the first.
55. (b) The words in all other pairs are synonyms.
56. (c)  $(9-7)^2 = 4$ ,  $(13-7)^2 = 36$ ,  $(11-7)^2 = 16$ , but  $(9-5)^2 \neq 25$ .
57. (d) The difference in all the other cases is 12..
58. (c) The product in all other cases is 96.
59. (d) The first two are to be added and the third is to be subtracted to give a constant no. 6 viz.  $5+4-3=6$ ,  $8+3-5=6$ , etc. but  $6+5-4 \neq 6$
60. (c) It does not have '4' in the middle.
61. (b) The total no. of digits is seven, others are six.
62. (c) It is the set of all prime numbers.
63. (d) The sum is not divisible, like other sets.
64. (b) The sum of all numbers in each set is 100 except (b)  $\neq 100$ .

# 3

CHAPTER

# CODING-DECODING

**Code :** A code is a system of words, letters, numbers or symbols that represent a message or record information secretly or in a shorter form.

**Coding :** It is a method of transmitting a message between the sender and the receiver such that no other person can understand the message.

In coding, actual alphabets/words/terms/numbers are replaced by certain other alphabets/words/numbers/symbols etc. according to a specific rule. To solve this type of questions we have to required to detect the rule and then answer the questions.

**Decoding :** It is a method to find the meaning of something that has written in code.

## (A) Letter Coding

### Methods of coding :

- Skipping over the letter in the forward or backward direction.
- Writing the letters of given word in reverse order in part or in whole.
- Sometimes codes may be the position of those letters in alphabet.

### Example 1 :

The word RUN is coded as SVO. What should be the code letters of LAY?

### Solution :

Here,  $\begin{array}{ccc} R & U & N \\ \downarrow & \downarrow & \downarrow \\ S & V & O \end{array}$

 $\downarrow +1 \quad \downarrow +1 \quad \downarrow +1$ 

$\therefore \begin{array}{ccc} L & A & Y \\ \downarrow & \downarrow & \downarrow \\ M & B & Z \end{array}$

 $\downarrow +1 \quad \downarrow +1 \quad \downarrow +1$ 

$\therefore$  LAY should be MBZ.

### Example 2 :

In a certain code DELHI is written as CDKGH. How is SUSPECT written in code?

### Solution :

Clearly, we can see that each letter of the word DELHI is moved one step backward to obtain the code.

$\begin{array}{ccccc} D & E & L & H & I \\ -1 \downarrow & -1 \downarrow & -1 \downarrow & -1 \downarrow & -1 \downarrow \\ C & D & K & G & H \end{array}$

Similarly, SUSPECT will be coded as RTRODBS.

### Example 3 :

In a certain code COURAGE is written as UOCREGA. How will JOURNAL be written in the code.

### Solution :

Clearly, when COURAGE is coded, some letters are interchange with respect to their positions, i.e., odd position are interchanged.

$\begin{array}{ccccccc} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ C & O & U & R & A & G & E \\ \swarrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \end{array}$

Position 1 changes to 3 and 3 to 1.

Position 5 changes to 7 and 7 to 5.

$\therefore 1 2 3 4 5 6 7$  can be coded as UOJRLAN.

$\begin{array}{ccccccc} & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ J & O & U & R & L & A & N \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \end{array}$

## (B) Number Coding

This type of coding involves two types of cases :

- numerical code values are assigned to a word:
- alphabetical code letters are assigned to the numbers.

### I. When numerical code values are assigned to words :

### Example 4 :

If D = 4 and COVER = 63, then BASIS = ?

### Solution :

Clearly, in the given code, A = 1, B = 2, C = 3, .... so that COVER =  $3 + 15 + 22 + 5 + 18 = 63$

$$\therefore \text{BASIS} = 2 + 1 + 19 + 9 + 19 = 50.$$

### II. When alphabetical code values are assigned to the numbers.

### Example 5 :

In a certain code, 15789 is written as XTZAL and 2346 is written as NPSU. How is 23549 written in the code?

### Solution :

$\begin{array}{ccccccc} 1 & 5 & 7 & 8 & 9 & & 2 & 3 & 4 & 6 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \text{and} & \downarrow & \downarrow & \downarrow & \downarrow \\ X & T & Z & A & L & & N & P & S & U \end{array}$

$\begin{array}{ccccccc} 2 & 3 & 5 & 4 & 9 & & \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \text{So,} & \downarrow & \downarrow & \downarrow \\ N & P & T & S & L & & \end{array}$

$\therefore$  23549 can be written in code as NPTSL.

**(C) Substitution Coding**

In this type of coding, different objects are assigned code names.

**Example 6 :**

If 'orange' is called 'butter', 'butter' is called 'soap', 'soap' is called 'ink', 'ink' is called 'honey' and 'honey' is called 'orange'. Which of the following is used for washing clothes?

- |            |            |
|------------|------------|
| (a) Honey  | (b) Butter |
| (c) Orange | (d) Soap   |
| (e) Ink.   |            |

**Solution :**

We know, soap is used for washing clothes.

Here, soap is called ink.

∴ Ink is used in washing the clothes.

Hence (e) is the correct answer.

**Example 7 :**

If 'light' is called 'morning', 'morning' is called 'dark', 'dark' is called 'night', 'night' is called 'sunshine' and 'sunshine' is called 'dusk', when do we sleep ?

- |           |              |
|-----------|--------------|
| (a) Dusk  | (b) Dark     |
| (c) Night | (d) Sunshine |

**Solution :**

(d) In the code, night is called sunshine. As we sleep in night, the correct answer is sunshine.

**(D) Mixed letter coding**

In this type of questions, three or more sentences are given in the coded language and the code for a particular word is asked. To find the code for the particular word, pickup two sentences bearing a common word and the common code word will mean that word. Proceeding in

similar manner, we can be determined a particular code word for each word of given sentences.

**Example 8 :**

In a certain code language, 'pit dar na' means 'you are good' 'dar tok pa' means 'good and bad' 'tim na tok' means 'they are bad'.

In that language, which word stands for 'they'?

- |         |         |
|---------|---------|
| (a) na  | (b) tok |
| (c) tim | (d) pit |

**Solution :**

In first two sentences, 'good' is common

∴ 'good' stands for 'dar'.

In last two sentences, 'bad' is common.

∴ 'bad' stands for 'tok'.

In first and last sentences, 'are' is common.

∴ 'are' stands for 'na'.

Hence in last sentence, 'na' stands for 'are' 'tok' stands for 'bad'.

Thus, 'tim' stands for 'they'.

**Example 9 :**

In a certain code language, 'po ki top ma' means 'Usha is playing cards'. 'kop ja ki ma' means 'Asha is playing tennis', 'ki top sop ho' means 'they are playing football' and 'po sur kop' means 'cards and tennis'. Which word in that language means 'Asha' ?

- |         |         |
|---------|---------|
| (a) ja  | (b) ma  |
| (c) kop | (d) top |

**Solution :**

(a) Comparing relation in each of the statement, we get  
Asha is coded as 'ja'.

**EXERCISE**

1. If CIGARETTE is coded as GICERAETT, then DIRECTION will be coded as :
 

(a) IRDCTIONE	(b) NOIETCRID
(c) RIDTCENOI	(d) NORTECDII
2. In a code, CORNER is written as GSVRIV. How can CENTRAL be written in that code?
 

(a) DFOUSBM	(b) GIRXVEP
(c) GJRYVEP	(d) GNFJKER
3. If VICTORY is coded as YLFWRUB, then how can SUCCESS be coded in that code language ?
 

(a) VXEEIVV	(b) VXFFHVV
(c) VYEEHVV	(d) None of these
4. If FRIEND is coded as HUMJTK, how is CANDLE written in that code?
 

(a) EDRIRL	(b) DCQHQK
(c) ESJFME	(d) FYOBOC
5. In a certain code 'Kit Mit Fit' means 'I Am Laborious'; 'Zit Rit Kit' means 'Laborious Is Dangerous' and 'Sit Fis Rit' means 'Dangerous Extremely Painful' then in that language what is code for 'Is'?
 

(a) Kit	(b) Zit
(c) Rit	(d) Data inadequate
6. In a code STATION is denoted by URCRKMP then BRING is denoted in the same code by
 

(a) CSKLH	(b) DSGLH
(c) KSKPH	(d) None of these
7. In a certain code '289' means 'Read from newspaper', '276' means 'tea from field' and '85' means 'Wall newspaper'. Which of the following number is used for 'tea'?
 

(a) 2	(b) 6
(c) Either 7 or 6	(d) Either 2 or 6
8. If 'black' means 'white', 'white' means 'red', 'red' means 'yellow', 'yellow' means 'blue', 'blue' means 'green', 'green' means 'purple' and 'purple' means 'orange' then what is the colour of clean sky?
 

(a) green	(b) purple
(c) blue	(d) yellow
9. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?
 

(a) 318826	(b) 214673
(c) 214763	(d) 216473

10. If VICTORY is coded as YLFWRUB, how can SUCCESS be coded?  
 (a) VXEEIVV      (b) VXFFHVV  
 (c) VYEEHVV      (d) VYEFIVV
11. In a certain code 'ni tim si' means 'How are you'; 'ble ni si' means 'where are you', then which of the following word is used for 'where'?  
 (a) ni      (b) tim  
 (c) si      (d) None of these
12. In a certain code, SUBSTITUTION is written as ITSBUSNOITUT. How is DISTRIBUTION written in that code?  
 (a) IRTSIDNOITUB      (b) IRTSIDNOIBUT  
 (c) IRDISNOITUB      (d) IRDISNOIUTB
13. If DIAMOND is coded as VQYMKLV, how is FEMALE coded?  
 (a) TUMYNLU      (b) UVNZOV  
 (c) UVNYNV      (d) TVNYNV
14. If MOBILITY is coded as 46293927, then EXAMINATION is coded as  
 (a) 45038401854      (b) 56149512965  
 (c) 57159413955      (d) 67250623076
15. If 'sky' is called 'sea', 'sea' is called 'water', 'water' is called 'air', 'air' is called 'cloud' and 'cloud' is called 'river', then what do we drink when thirsty?  
 (a) Sky      (b) Air  
 (c) Water      (d) Sea
16. In a certain code, 15789 is written as XTCAL and 2346 is written as NPSU. How is 23549 written in that code?  
 (a) NPTUL      (b) PNTSL  
 (c) NPTSL      (d) NBTSL
17. If in a certain code PERINATH is written as QFQHOBSG and POLE as QPKD, how will SYNDROME be written in that code?  
 (a) RXOEQNMF      (b) TZODQNL  
 (c) TZMCSPKD      (d) TZMCSPLD
18. In a certain code BANKER is written as LFSCBO. How will CONFER be written in that code?  
 (a) GFSDPO      (b) FGSDOP  
 (c) GFSEPO      (d) FHSDPO
19. If 'gnr tag zog qmp' stands for 'Seoul Olympic Organising Committee'; 'hyto gnr emf' stands for 'Summer Olympic Games' and 'esm sdr hyto' stands for 'Modern Games History', what would be the code for 'Summer'?  
 (a) hyto      (b) gnr  
 (c) emf      (d) zog
20. In a certain code, '247' means 'spread red carpet'; '256' means 'dust one carpet' and '264' means 'one red carpet'. Which digit in that code means 'dust'?  
 (a) 2      (b) 3  
 (c) 5      (d) 6
21. In a certain code, COMPUTER is written as RFUVQNP. How is MEDICINE written in the same code?  
 (a) EOJDJEFM      (b) EOJDEJFM  
 (c) MFEJDJOE      (d) MFEDJJOE
22. In certain code, SIKKIM is written as THLJJL. How is a TRAINING written in that code?  
 (a) SQBHOHOH      (b) UQBHOHOF  
 (c) UQBJOHHO      (d) UQBJOHOO
23. If ENGLAND is written as 1234526 and FRANCE is written as 785291, how is GREECE coded?  
 (a) 381171      (b) 381191  
 (c) 832252      (d) 835545
24. In a certain code language, '3a, 2b, 7c' means 'Truth is Eternal'; '7c, 9a, 8b, 3a' means 'Enmity is not Eternal' and '9a, 4d, 2d, 8b' means 'Truth does not perish'. Which of the following means 'Enmity' in that language?  
 (a) 3a      (b) 7c  
 (c) 8b      (d) 9a
25. If 'nitco sco tingo' stands for 'softer than flower'; 'tingo rho mst' stands for 'sweet flower fragrance' and 'mst sco tmp' stands for 'sweet than smile', what would 'fragrance' stand for?  
 (a) rho      (b) mst  
 (c) tmp      (d) sco
26. If DELHI is coded as CCIDD, how would you encode BOMBAY?  
 (a) AJMTVT      (b) AMJXVS  
 (c) MJXVSU      (d) WXYZAX
27. If DELHI is coded as 73541 and CALCUTTA as 82589662, how can CALICUT be coded?  
 (a) 5279431      (b) 5978213  
 (c) 8251896      (d) 8543691
28. If 'cinto baoli tsz nzro' means 'her village is Sarupur'; 'mhi cinto keepi tsz oind' means 'her first love is literature' and 'oind geit tsz cinto pki' means 'literature collection is her hobby', which word means 'literature'?  
 (a) cinto      (b) baoli  
 (c) oind      (d) geit
29. If REASON is coded as 5 and BELIEVED as 7, what is the code number for GOVERNMENT?  
 (a) 6      (b) 8  
 (c) 9      (d) 10
30. If CONTRIBUTE is written as ETBUIRNTOC, which letter will be in the sixth place when counted from the left if POPULARISE is written in that code?  
 (a) L      (b) A  
 (c) I      (d) R
31. In a certain code language the word 'DISPLAY' is written as 'BLQSJDW'. How will the word 'PROJECT' be written in that language?  
 (a) NUMMCER      (b) NUNMCFR  
 (c) NTNMCFR      (d) None of these

32. In a certain code language the word 'STANDING' is written as 'NATSGNID'. How will the word 'PRODUCES' be written in that language?  
 (a) DOPRSECU      (b) DORPSCEU  
 (c) DORPSECU      (d) DORPESCU
33. In a certain language the word DISTANCE is written as FLUWCQEH. How will the word NUMERALS be written in that code language?  
 (a) PXNHTDNV      (b) PXOITDNV  
 (c) PWOHTDNV      (d) PXOHTDNV
34. In a certain code language, the word FUTILE is written as HYVMNI. How will the word PENCIL be written in that language?  
 (a) OIFRLT      (b) OIFRLS  
 (c) OLFRIT      (d) None of these
35. If PAIN is coded as UFNS, then what will be the code for REST in that code language?  
 (a) QFRS      (b) WJXY  
 (c) PCQV      (d) ANPL
36. If NOR is coded as 2-3-6, then how should REST be coded in the same code language ?  
 (a) 6-19-6-7      (b) 5-19-5-8  
 (c) 6-19-5-6      (d) 6-18-5-8
37. In a code language, 123 means 'hot filtered coffee', 356 means 'very hot day', 589 means 'day and night'. Which numerical stands for 'very'?  
 (a) 5      (b) 6  
 (c) 8      (d) 9
38. If CLOCK is coded as 34235 and TIME as 8679, what will be the code for MOLEK?  
 (a) 62495      (b) 62945  
 (c) 72495      (d) 72945
39. If Z = 52 and ACT is equal to 48, then BAT will be equal to :  
 (a) 39      (b) 41  
 (c) 44      (d) 46
40. In a certain code, 15789 is written as EGKPT and 2346 is written as ALUR. How is 23549 written in that code ?  
 (a) ALEUT      (b) ALGTU  
 (c) ALGUT      (d) ALGRT
41. In a certain coding system, RBM STD BRO PUS means 'the cat is beautiful'. TNH PUS DIM STD means 'the dog is brown'. PUS DIM BRO PUS CUS means 'the dog has the cat'. What is the code for 'has' ?  
 (a) CUS      (b) BRO  
 (c) DIM      (d) STD
42. In a certain language  
 PIC VIC NIC means 'winter is cold'  
 TO NIC RE means 'summer is hot'  
 RE THO PA means 'nights are hot'  
 Which of the following is the code for 'summer'?  
 (a) TO      (b) NIC  
 (c) PIC      (d) VIC
43. If ASSIGN is coded as SASING, then KIDNAP is coded as  
 (a) IKNDPA      (b) IKDNPA  
 (c) IKDNAP      (d) IKAPDN
44. If 'water' is called 'food', 'food' is called 'tree', 'tree' is called 'sky', 'sky' is called 'wall', on which of the following grows a fruit?  
 (a) Water      (b) Food  
 (c) Sky      (d) Tree
45. In a certain code OVER is written as \$%#\* and VIST is written in that code ?  
 (a) x\$%\*      (b) %x\$\*  
 (c) x\*\$%      (d) None of these
46. In a certain code 'gri chri' means 'brand new' 'gyp twoh' means 'very old', 'gri bur twoh' means 'old and new' and 'chri deh gyp' means 'old brand car'. Which of the following codes means 'new car'?  
 (a) chri gri      (b) gri deh  
 (c) deh gyp      (d) twoh deh
47. If ZXY stands for ACE; what will YZW stand for :  
 (a) ABD      (b) EAC  
 (c) SAD      (d) BAD
48. If CHAIR is coded as FKDLU then RAID is coded as :  
 (a) ULGD      (b) ULKG  
 (c) ULDG      (d) UDLG
49. In a certain code language, 'ne ri so' means 'good rain day' 'si ne po' means 'day is wonderful' and 'ri jo' means 'good boy'. Which of the following means 'rainy in the code'?  
 (a) ne      (b) si  
 (c) ri      (d) so
50. JUNE is coded as NXPF, how will STAY be coded in the same manner ?  
 (a) WWCZ      (b) WVCZ  
 (c) WWDB      (d) VWZC
51. If ACTION is coded as ZXGRLM, then HEALTH will be coded in the same way as :  
 (a) SVZOQS      (b) TVZOQT  
 (c) RUZPGR      (d) QVGOZQ
52. If EARTHQUAKE is coded as MOGPENJOSM, then EQUATE will be coded as :  
 (a) MENOPM      (b) MENOMP  
 (c) MJOGPM      (d) MNJOPM
53. If 'w' is coded as 'a', 's' as 'r' and 'r' as 'w' how will 'answer' be written ?  
 (a) wnsaes      (b) anraew  
 (c) anrwas      (d) wnraes
54. In a certain code APPROACH is coded as CHOAPRAP. How will RESTRICT be coded ?  
 (a) CTRISTER      (b) ERTSIRTC  
 (c) CTRISTRE      (d) TCIRSTRE

55. If 341782 denotes MONKEY and 0596 denotes RAGS, then 75195044 will denote  
 (a) KANGAROO (b) PALMANTT  
 (c) HANGAMEE (d) KARNAGOO
56. Certain letters are coded as : TODAY-457338 WROTE-10542. DATE-7342 and DIRTH-79046. What does the code number '5' stand for ?  
 (a) D (b) R  
 (c) O (d) T
57. EXCURSION is coded as CXEURTNOL, SCIENTIST will be coded in the same manner as :  
 (a) TSIICSNTE (b) ICSNTETSI  
 (c) ICSTNETSI (d) ICSNTEIST
58. If FADE is coded as UZWW, then what does IFHG stand for in the same code ?  
 (a) RUST (b) PORT  
 (c) HERI (d) IHER
59. HORSE is written in certain code as BUNGY and CAT as HOW, how will CHEST be written in the same code ?  
 (a) OBYGW (b) WYGBN  
 (c) UNHBY (d) HBYGW
60. In a certain code language CHILD is written as IMOQJ. How will BABE be written in the same language ?  
 (a) HFHJ (b) FGFK  
 (c) FFGJ (d) HFGJ
61. If DOWN is coded as FQYP, then the word WITH will be coded as :  
 (a) KYJV (b) IJKK  
 (c) YKVJ (d) JKVV

**DIRECTIONS (Qs. 62 - 67) :** Read the following information and answer the questions that follow :

In a certain code language, 481 means *Sky is blue*. 246 means *Sea is deep* and 698 means *Sea looks blue*.

62. What number is the code for 'sky' ?  
 (a) 4 (b) 8  
 (c) 1 (d) None of these
63. What number is the code for 'is' ?  
 (a) 8 (b) 1  
 (c) 4 (d) 2
64. What number is the code for 'looks' ?  
 (a) 4 (b) 8  
 (c) 6 (d) 9
65. What number is the code for 'sea' ?  
 (a) 2 (b) 8  
 (c) 6 (d) 4

66. What number is the code for 'blue' ?  
 (a) 8 (b) 6  
 (c) 1 (d) 9
67. What number is the code for 'deep' ?  
 (a) 4 (b) 2  
 (c) 6 (d) 1

**DIRECTIONS (Qs. 68 - 71) :** In a defence message, GET AWAY, FIRE BACK-WARDS, MOVE SLOW is coded as BEN CDCI, QHOEPCTLDCOXU, ZMWEVFMD.

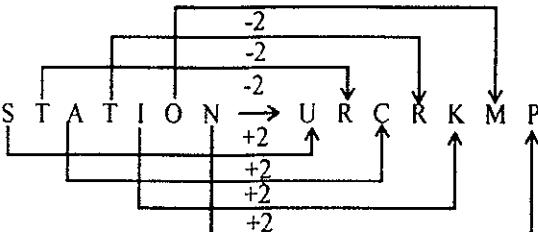
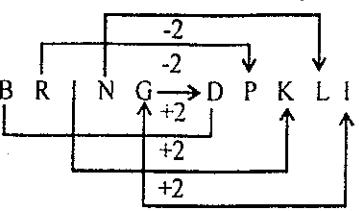
Based on this coding scheme, spot the codes for the words given in the questions below :

68. OVER  
 (a) MWOE (b) MWZO  
 (c) MWEQ (d) MWED
69. DEADLY  
 (a) XECXEI (b) XENXFI  
 (c) XECXEL (d) XECXF
70. REWARD  
 (a) OEDNXE (b) OTDCOX  
 (c) OEDCOX (d) OEDCOU
71. GREAT  
 (a) BOENC (b) BOEQN  
 (c) BOECN (d) BOEHC

**DIRECTIONS (Qs. 72 - 75) :** In a secret way of writing INDIA HAS WON FIRST GOLD MEDAL is written as JEZJU OUV SEF PJDVB REQZ ITZUQ. Bearing the method in mind, pick up the code from the answer choices for each given word.

72. FOOT  
 (a) PEEB (b) SEEZ  
 (c) BEEB (d) CEEA
73. DIESEL  
 (a) ZJVTQ (b) ZJEVTQ  
 (c) BZTETV (d) LEEB
74. WOOD  
 (a) SEEZ (b) BEEZ  
 (c) ZEES (d) LEEB
75. TAILOR  
 (a) BUTQEP (b) BUJQED  
 (c) ZUTQED (d) SUTQED
76. If A + B = C, D - C = A and E - B = C, then what does D + F stands for ? Provide your answer in letter terms as well as in number terms.  
 (a) J & 10 (b) A & 1  
 (c) C & 3 (d) Q & 17

# SOLUTIONS

1. (c) CIG → GIC, ARE → ERA, TTE → ETT  
 $\Rightarrow \text{DIRECTION} \rightarrow \text{RIDTCENOI}$
2. (b) Each letter of the word is moved four steps forward to obtain the code.
3. (b) Each letter of the word is moved three steps forward to obtain the code.
4. (a) The first, second, third, fourth, fifth and sixth letters of the word are respectively moved two, three, four, five, six and seven steps forward to obtain the corresponding letters of the code.
5. (b) 'Kit Mit Fit' means 'I Am Laborious' ... (i)  
 'Zit Rit Kit' means 'Laborious Is Dangerous' ... (ii)  
 and  
 'Sit Fis Rit' means 'Dangerous Extremely painful' .... (iii)  
 From (i) and (ii), 'Kit' means 'Laborious' and from (ii) and (iii), 'Rit' means 'Dangerous'  
 $\therefore$  From (ii) it is clear that for 'Is' the code is 'Zit'.
6. (d) As
- 
- Similarly
- 
7. (c) '289' means 'Read from newspaper' ..... (i)  
 '276' means 'tea from field' ..... (ii)  
 On comparing (i) and (ii), 2 is used for, 'from'  
 $\therefore$  From (ii) for tea the number is either 6 or 7.
8. (a) The colour of clean sky is blue and blue means green.  
 Hence, the colour of clean sky is green.
9. (b) The alphabets are coded as shown:
- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| R | O | S | E | C | H | A | I | P |
| 6 | 8 | 2 | 1 | 7 | 3 | 4 | 5 | 9 |
- So, in SEARCH, S is coded as 2, E as 1, A as 4, R as 6, C as 7, H as 3. Thus, the code for SEARCH is 214673.
10. (b) Each letter of the word is moved three steps forward to obtain the code.
11. (d) 'ni tim si' means 'How are you' ..... (i)  
 'ble ni si' means 'where are you' ..... (ii)  
 From (i) and (ii), 'ni si' means 'are you'  
 $\therefore$  ble → where
12. (a) The first six letters and then the last six letters are written in a reverse order to obtain the code.
13. (a) If in the word, a letter is nth letter from the beginning of the English alphabet, then in the code the corresponding letter is the  $(n+1)$ th letter from the end of the alphabet.
14. (b) Let A = 1, B = 2, C = 3, ..., X = 24, Y = 25, Z = 26.  
 Then, M = 13 = 1 + 3 = 4; O = 15 = 1 + 5 = 6  
 L = 12 = 1 + 2 = 3; T = 20 = 2 + 0 = 2;  
 Y = 25 = 2 + 5 = 7.  
 So, MOBILITY = 46293927.  
 Similarly, EXAMINATION = 56149512965
15. (b) One drinks 'water' when thirsty and as given, 'water' is called 'air'.
16. (c)  $15789 \equiv \text{XTCAL}$   
 $\& 2346 \equiv \text{NPSU}$   
 $\Rightarrow 2 \rightarrow N, 3 \rightarrow P, 5 \rightarrow T, 4 \rightarrow S$  and  $9 \rightarrow L$   
 Hence, 23549 will be coded as NPTSL.
17. (d) As,
- |                 |                 |                 |                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| P               | E               | R               | I               | N               | A               | T               | H               |
| $\downarrow +1$ | $\downarrow +1$ | $\downarrow -1$ | $\downarrow -1$ | $\downarrow +1$ | $\downarrow +1$ | $\downarrow -1$ | $\downarrow -1$ |
| Q               | F               | Q               | H               | O               | B               | S               | G               |
- Similarly,
- |                 |                 |                 |                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| S               | Y               | N               | D               | R               | O               | M               | E               |
| $\downarrow +1$ | $\downarrow +1$ | $\downarrow -1$ | $\downarrow -1$ | $\downarrow +1$ | $\downarrow +1$ | $\downarrow -1$ | $\downarrow -1$ |
| T               | Z               | M               | C               | S               | P               | L               | D               |
18. (a) Here, the coding has been done in two steps. In the first step, the letters of the words are split into two groups having equal number of letters, i.e.
- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| B | A | N | K | E | R |
|---|---|---|---|---|---|
- After that the position of the groups are interchanged.  
 i.e.
- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| K | E | R | B | A | N |
|---|---|---|---|---|---|
- And in the second step, each letter is moved one step forward.
- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| K | E | R | B | A | N |
| L | F | S | C | B | O |
- Thus the code for BANKAR is LFSCBBO. Similarly, the code of CONFER can be obtained as follows:
- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| C | O | N | F | E | R |
|---|---|---|---|---|---|

F	E	R	C	O	N
---	---	---	---	---	---

G	F	S	D	P	O
---	---	---	---	---	---

← Coded word

19. (c) In the first and second statements, the common code word is 'gnr' and the common word is 'Olympic'. So, 'gnr' means 'Olympic'. In the second and third statements, the common word is 'Games' and common code word is 'hyto'. So, 'hyto' means 'Games'. Thus, in the second statement, 'emf' means 'Summer'.
20. (c) In the first and second statements, the common code digit is '2' and the common word is 'carpet'. So '2' means 'carpet'. In the second and third statements, the common code digit is '6' and the common word is 'one'. So, '6' means 'one'. Therefore in second statement, '5' means 'dust'.
21. (a) The letters of the word are written in a reverse order and each letter, except the first and the last one, is moved one step forward, to obtain the code.
22. (b) First, third and fifth letters are moved one step forward and second, fourth and sixth letters are moved one step backward to obtain the corresponding letters of the code.
23. (a) The alphabets are coded as shown :
- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| E | N | G | L | A | D | F | R | C |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
- So, G is coded as 3, R as 8, E as 1 and C as 9. Thus, GREECE is coded as 381191.
24. (c) In the second and third statements, the common code is '9a' and the common word is 'not'. So, '9a' means 'not'. In the first and second statements, the common codes are '7c' and '3a' and the common words are 'is' and 'Eternal'. So, in the second statement, '8b' means 'Enmity'.
25. (a) In the first and second statements, the common code word is 'tingo' and the common word is 'flower'. So, 'tingo' stands for 'flower'. In the second and third statements, the common code word is 'mst' and the common word is 'sweet'. So 'mst' stands for 'sweet'. Thus, in the second statement, 'rho' stands for 'fragrance'.
26. (b) The first, second, third .....letters of the word are respectively moved one, two, three,.....steps backward to obtain the corresponding letters of the code.
27. (c) The alphabets are coded as follows:
- |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| D | E | L | H | I | C | A | U | T |
| 7 | 3 | 5 | 4 | 1 | 8 | 2 | 9 | 6 |

So, in CALICUT, C is coded as 8, A as 2, L as 5, I as 1, U as 9 and T as 6. Thus, the code for CALICUT is 8251896.

28. (c) In the first and second statements, the common code words are 'cinto' and 'tsi' and the common words are 'her' and 'is'. So, 'cinto' and 'tsi' are the codes for 'her' and 'is'. In the second and third statements, the common code words are 'cinto', 'tsi' and 'oind' and the common words are 'her', 'is' and 'literatuue'. Now, 'cinto' and 'tsi' are codes for 'her' and 'is'. So, 'oind' stands for 'literature'.
29. (c) Code for the given word = (Number of letters in the word) - 1.  
So, code for GOVERNMENT =  $10 - 1 = 9$ .
30. (a) The letters of the word are written in a reverse order and then the third and fourth letters from the begining and the end of the word so formed are reversed in order, to obtain the code. Thus, the code for POPULARISE is ESRIALPUOP.
31. (d) The odd-number positioned letters move two letters backward and the even number positioned ones move three letters forward. Thus PROJECT will become NUMMCFR.
32. (c) The first four letters are first written in reverse order. This is followed by the last four letters, also in reverse order.
33. (d) Odd-positioned letters are coded as two positions forward and even-positioned letters are coded as three positions forward.
34. (d) odd-placed letters are coded as two places forward and even-placed letters are coded as four places forward.
35. (b) Each letter of the word is moved five steps forward to obtain the code.
36. (c) Difference between alphabetical positions of N and O = 1 = difference between 2 and 3  
Difference between alphabetical positions of O and R = 3 = Diff. between 3 and 6.  
Similarly, for REST,  
difference between R and E = 13,  
difference between E and S = 14  
and difference between S and T = 1  
Here, only option (c) follows above condition
37. (b) 1    2    ③ → hot    filtered    coffee  
 ③    5    6 → very    hot    day  
 5    8    9 → day    and    night
- Clearly, '6' stands for 'very'.
38. (c) The alphabets are coded as follows :  
 C L O K T I M E .  
 3 4 2 5 8 6 7 9  
 So, the code for MOLEK is 72495.
39. (d) Z =  $52 = 26 \times 2$ .  
 ACT =  $1 \times 2 + 3 \times 2 + 20 \times 2 = 48$   
 [Alphabetical position numbers has been doubled]  
 ⇒ BAT =  $2 \times 2 + 1 \times 2 + 20 \times 2 = 46$

40. (c) Here, 2 → A, 3 → L, 5 → G, 4 → U and 9 → T.

Hence, 23549 will be having the code ALGUT.

41. (a) RBM STD BRO PUS = the cat is beautiful ..... (i)

TNH PUS DIM STD = the dog is brown ..... (ii)

PUS DIM BRO PUS CUS = the dog has the cat ..... (iii)

(i) and (ii) ⇒ STD PUS = is

(ii) and (iii) ⇒ PUS DIM = the dog

(i) and (iii) ⇒ PUS BRO = the cat

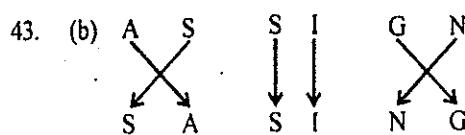
∴ From (iii), CUS = has

42. (a) PIC VIC **NIC** → winter is cold

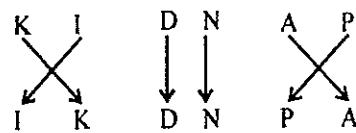
TO **NIC** **RE** → summer is hot

**RE** THO PA → nights are hot

Clearly, 'TO' stands for 'summer'.



Similarly,



44. (c) The fruits grow on a 'tree' and 'tree' is called 'sky'. So the fruits grow on the 'sky'.

45. (a)

0	V	E	R
↓	↓	↓	↓
\$	#	%	*

 and 

V	I	S	T
↓	↓	↓	↓
#	+	X	-

S O R E

↓ ↓ ↓ ↓

X \$ \* %

46. (b)

Code

1. gri chri

2. gyp twoh

3. gri bur twoh

4. chri deh gyp

Sentence

brand new

very old

old and new

old brand car

The word 'new' is present in 1st and 3rd sentences so is the code in 1st and 3rd sentences and so is the code 'gri'. The word 'car' is only in the 4th sentence and code 'deh' is repeated in any other sentence.

47. (d) The letters of the word ACE are deciphered by decoding ZXV. The letters are decoded by substituting their represented letters in the natural order, (i.e., 'Z' 1st in the reverse series and 'A' is 1st in natural series).

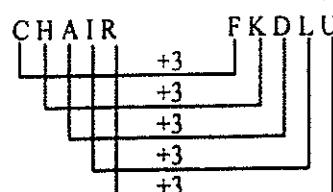
Z X V → letters in reverse series

A C E → letters in natural series

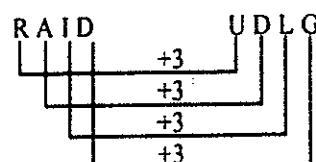
↓ ↓ ↓

1st 3rd 5th → Position of letters

48. (d) The word is coded by moving the letters three steps forward



Similarly,



49. (d)

ne ri so  
si ne po

good rainy day  
day is wonderful

ne is common  
⇒ ne means day

day is common

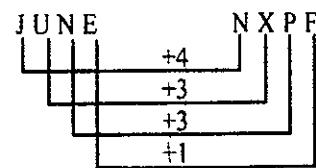
Again ; ri jo  
ne ri so

good boy  
good rain day

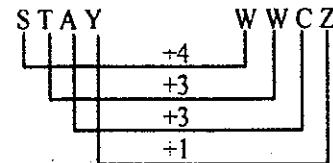
ri is common  
⇒ ri mean good.

Thus, so means rainy.

50. (a) The word is coded by moving the letters +4, +3, +2, and +1 steps respectively.



Similarly,



51. (a) The letters of the word are coded by their represented letters in the reverse series.

A	C	T	I	O	N	→	letters in natural series
Z	X	G	R	L	M	→	letters in reverse series
↓	↓	↓	↓	↓	↓		
1 <sup>st</sup>	3 <sup>rd</sup>	20 <sup>th</sup>	9 <sup>th</sup>	15 <sup>th</sup>	14 <sup>th</sup>	→	Position of letters

Similarly,

H	E	A	L	T	H	→	letters in natural series
S	V	Z	O	G	S	→	letters in reverse series
↓	↓	↓	↓	↓	↓		
8 <sup>th</sup>	5 <sup>th</sup>	1 <sup>st</sup>	12 <sup>th</sup>	20 <sup>th</sup>	8 <sup>th</sup>	→	Position of letters

52. (d) The alphabets in word EQUATE are taken from the given word EARTHQUAKE Tally the letters from the coded word to get the answer code.

E	A	R	T	H	Q	U	A	K	E	→	letters
M	O	G	P	E	N	J	O	S	M	→	code
E	Q	U	A	T	E	→	letters to be coded				
M	N	J	O	P	M	→	answer code				

53. (b) Alphabets whose codes are given

w	→	a
s	→	r
r	→	w

All other alphabets will remain unchanged, so, 'answer' will be coded as :

answe	r	anraew

54. (c) The word is divided into sections containing two letters each, the then the section are written backwards.

AP PR OA CH	CH OA ST RE

Similarly,

RE ST RI CT	CT RI ST RE

55. (a) The number represent letters and to find the answer, select the respective letters.

341782      0592      → letters

MONKEY      RAGS      → code

So,

7 5 1 9 5 0 4 4      → code

KANGAROO      → answer letters

56. (c) The manner of coding is

TODAY	WROTE	DATE	DIRTH
45738	10542	7342	79046

The number '5' is common in words TODAY and WROTE, and so is the letter 'O'. Letter 'T' cannot be the answer because it is common in all the four words and so is its number code '4'.

57. (c) The word is divided into three equal sections, and the letters of first and third sections are written backwards.

EXC URT ION	CXE URT NOI

Similarly,

SCI ENT IST	ICS TNE TSI

58. (a) The letters of the coded word are decoded the represent letters in the reverse series.

U	Z	W	V	→	(letters in natural series)
F	A	D	E	→	(letters in reverse series)
↓	↓	↓	↓		

21<sup>st</sup> 26<sup>th</sup> 23<sup>rd</sup> 22<sup>nd</sup> → (position of letters)

Similarly,

I	F	G	H	→	(letters in natural series)
R	U	S	T	→	(letters in reverse series)
↓	↓	↓	↓		

9<sup>th</sup> 6<sup>th</sup> 7<sup>th</sup> 8<sup>th</sup> → (position of letters)

59. (d) The letters of the word are coded by represented letters To find the answer code, select the coded represented letters.

HORSE      CAT      → letters

BUNGY      HOW      → substituted letter codes

So,

CHEST      → letters

HBYGW      → substituted answer letter codes

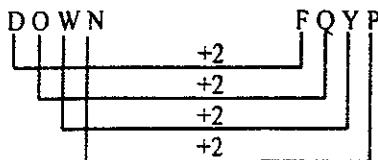
60. (a) The letters of word are moved six and five steps forward alternately.

CH I L D		I M O O J
	+6	
	+5	
	+6	
	+5	
	+6	

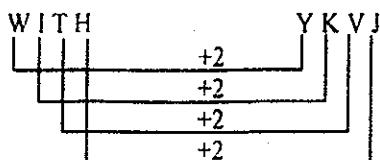
Similarly,

B A B E		H F H J
	+6	
	+5	
	+6	
	+5	

61. (c) The letters of the word are moved to steps forward.



Similarly,



- 62-67. '481' means 'sky is blue' ..... (i)  
 '246' means 'sea is deep' ..... (ii)  
 '698' means 'sea looks blue' ..... (iii)  
 (i) and (ii)  $\Rightarrow$  '4' means 'is'  
 (ii) and (iii)  $\Rightarrow$  '6' means 'sea'.  
 $\therefore$  From (ii), '2' means 'deep.'  
 (i) and (iii)  $\Rightarrow$  '8' means 'blue'.  
 $\therefore$  From (iii), '9' means 'looks'  
 and from (i) '1' means 'sky'

62. (c) 63. (c) 64. (d) 65. (c) 66. (a) 67. (b)  
 68-71

GET AWAY = BEN CDCI

FIRE BACK-WARDS = QHOEPCTLDCOXU

MOVE SLOW = ZMWE VFMD

- Here, G is denoted by B  
 E is denoted by E  
 T is denoted by N  
 A is denoted by C  
 W is denoted by D  
 Y is denoted by I  
 F is denoted by Q  
 I is denoted by H  
 R is denoted by O  
 B is denoted by P  
 C is denoted by T  
 K is denoted by L

D is denoted by X

S is denoted by U

M is denoted by Z

O is denoted by M

V is denoted by W

L is denoted by F

68. (c) 69. (d) 70. (c) 71. (c)

72-75

Here, I is denoted by J

N is denoted by E

D is denoted by Z

A is denoted by U

H is denoted by O

S is denoted by V

W is denoted by S

O is denoted by E

N is denoted by F

F is denoted by P

R is denoted by D

T is denoted by B

G is denoted by R

L is denoted by Q

M is denoted by I

E is denoted by T

72. (a) We have, F  $\equiv$  P, O  $\equiv$  E, T  $\equiv$  B. hence, code for FOOT is PEEB.

73. (a) D  $\equiv$  Z, I  $\equiv$  J, E  $\equiv$  T, S  $\equiv$  V, L  $\equiv$  Q

$\therefore$  DIESEL  $\equiv$  ZJVTIQ

74. (a) W  $\equiv$  S, O  $\equiv$  E, D  $\equiv$  Z

$\Rightarrow$  Code for WOOD is SEEZ

75. (b) T  $\rightarrow$  B, A  $\rightarrow$  U, I  $\rightarrow$  J, L  $\rightarrow$  Q, O  $\rightarrow$  E, R  $\rightarrow$  D

$\Rightarrow$  Code for TAILOR = BUJQED.

76. (a) Position of D alphabetically = 4

Position of F alphabetically = 6

Thus D + F = 10 = position of J in alphabet.



# 4

CHAPTER

# BLOOD RELATION

*Some blood relations are given below :*

- Mother's or father's daughter → Sister
- Mother's or father's son → Brother
- Mother's or father's father → Grand father
- Mother's or father's mother → Grand mother
- Father's brother → Uncle
- Father's sister → Aunt
- Mother's brother → Maternal uncle
- Mother's sister → Maternal aunt
- Son's wife → Daughter-in-law
- Daughter's husband → Son-in-law
- Husband's or wife's sister → Sister-in-law
- Husband's or wife's brother → Brother-in-law
- Brother's or sister's son → Nephew
- Brother's or sister's daughter → Niece
- Uncle's or aunt's son or daughter → Cousin
- Sister's husband → Brother-in-law
- Brother's wife → Sister-in-law
- Grand father's or grand mother's father → Great grand father
- Grand father's or grand mother's mother → Great grand mother
- Grand son's or grand daughter's daughter → Great grand daughter
- Grand son's or grand daughter's son → Great grand son.



## REMEMBER

- \* The only son of your father – Yourself
- \* Wife of the father – Mother
- \* The only son of grand father or grand mother – Father
- \* The only daughter-in-law of grand father or grand mother – Mother
- \* Mother-in-law of mother – Grand mother
- \* Father-in-law of mother – Grand father
- \* The only daughter of the father – Sister
- \* Son of the father of the sister – Brother
- \* Son of the only son of the father – Son
- \* Son of the only son of grand father – Brother
- \* Daughter of the only son of Grand father – Sister

⇒ When the relation between two persons are represented by codes or symbols like +, -, ×, □, etc then we say they have coded relation.

**Example 1 :**

A introduces B saying, "He is the husband of the grand daughter of the father of my father". How is B related to A?

**Solution :**

Father of the father means grand father, Grand daughter of the grand father means sister. Husband of the sister means brother-in-law.

So, B is A's brother-in-law.

**Example 2 :**

Pointing towards a person in a photograph, Anjali said, "He is the only son of the father of my sister's brother." How is that person related to Anjali?

**Solution :**

- Sister's brother → Brother
- Brother's father → Father
- Father's son → Brother
- ∴ The person in the photograph is Anjali's brother.

**Example 3 :**

There are six persons playing cricket namely U, V, W, X, Y and Z. U and Y are brothers. Z is the sister of Y. W is the only son of U's uncle. V and X are the daughters of the brother of W's father.

- (i) How is W related to Z?
- (ii) How many male players are there?
- (iii) How many female players are there?
- (iv) How is X related to U?

**Solution :**

- (i) Z is Y's sister and hence U's sister, which means W is also the son of Z's uncle. So, W is Z's cousin.
- (ii) U and Y are brothers. So U and Y are males. Z is the sister of Y and so Z is female. W is the son so W is male. V and X are daughters, so V and X are female. Thus, there are three males, i.e. U, W and Y.
- (iii) There are three females, i.e., V, X and Z.
- (iv) X's father is the brother of W's father and W's father is U's uncle. So, X's father is also U's uncle. Thus X is U's cousin.

**Example 4 :**

A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C?

**Solution :**

Here B is the brother of A,  
A's son is D's brother.

So, D is the daughter of A.

Since C and D are sisters and C is also the daughter of A.

$\therefore$  B is the uncle of C.

- (a) T is N's daughter.

- (b) N is wife of Q.

- (c) M is mother-in-law of Q.

- (d) Q is wife of N.

**Solution :**

$$M - N \times T + Q$$

$\Rightarrow$  M is the mother of N who is the father of T who is the daughter of Q. So, M is the grandmother of the daughter of Q, i.e., M is the mother-in-law of Q.

$\therefore$  (b) is not true.

**Example 5 :**

A, B, C, D, E, F and G are members of a family consisting of four adults and three children, two of whom, F and G are girls. A and D are brothers and A is a doctor. E is an engineer married to one of the brothers and has two children. B is married to D and G is their child. Who is C?

**Solution :**

E is married to A or D. But B is married to D.

Thus, E is married to A and A, B, D, E are four adults, and C, F, G are the three children in the family.

B and D have a child G.

A and E have two children, they are C and F.

F and G are only girls. So, C is a boy.

$\therefore$  C is son of A and E.

**Example (8-9) :**

Study the information given below and answer the questions following it:

Mohan is son of Arun's father's sister. Prakash is son of Reva, who is mother of Vikas and grandmother of Arun. Pranab is father of Neela and grandfather of Mohan. Reva is wife of Pranab.

8. How is Mohan related to Reva?

- (a) Grandson      (b) Son

- (c) Nephew      (d) Data inadequate

9. How is Vikas's wife related to Neela?

- (a) Sister      (b) Niece

- (c) Sister-in-law      (d) Data inadequate

**Solutions :**

Prakash is son of Reva, who is mother of Vikas  
 $\Rightarrow$  Prakash and Vikas are brothers.

Reva is wife of Pranab

$\Rightarrow$  Pranab is father of Prakash and Vikas.

Hence, Pranab – Reva

their children

Prakash, Vikas, Neela

Son

Mohan

Hence, Arun's father is either Prakash or Vikas.

8. (a)

9. (c) Since, Vikas is brother of Neela, therefore, his wife is sister-in-law of Neela.

**EXERCISE**

- Anil, introducing a girl in a party, said, she is the wife of the grandson of my mother. How is Anil related to the girl?  
 (a) Father      (b) Grandfather  
 (c) Husband      (d) Father-in-law
- A man said to a woman, "Your mother's husband's sister is my aunt." How is the woman related to the man?  
 (a) Granddaughter      (b) Daughter  
 (c) Sister      (d) Aunt
- Introducing Rajesh, Neha said, "His brother's father is the only son of my grand father". How Neha is related to Rajesh?  
 (a) Sister      (b) Daughter  
 (c) Mother      (d) Niece
- Vinod is the brother of Bhaskar. Manohar is the sister of Vinod. Biswal is the brother of Preetam and Preetam is the daughter of Bhaskar. Who is the uncle of Biswal?  
 (a) Bhaskar      (b) Manohar  
 (c) Vinod      (d) Insufficient data

5. A man said to a woman, "Your brother's only sister is my mother." What is the relation of the woman with the maternal grandmother of that man?  
 (a) Mother                   (b) Sister  
 (c) Niece                   (d) Daughter
6. Pointing to a photograph, a man said, "I have no brother or sister but that man's father is my father's son." Whose photograph was it?  
 (a) His own               (b) His son's  
 (c) His father's           (d) His nephew's
7. Pointing to a photograph, a lady tells Pramod, "I am the only daughter of this lady and her son is your maternal uncle," How is the speaker related to Pramod's father?  
 (a) Sister-in-law  
 (b) Wife  
 (c) Neither (a) nor (b)  
 (d) Can't be determined
8. Introducing a man, a woman said, "His wife is the only daughter of my mother." How is the woman related to that man?  
 (a) Aunt                   (b) Wife  
 (c) Mother-in-law          (d) Maternal Aunt
9. Deepak said to Nitin, "That boy playing with the football is the younger of the two brothers of the daughter of my father's wife." How is the boy playing football related to Deepak?  
 (a) Son                   (b) Brother  
 (c) Causin                (d) Nephew
10. A is the mother of B. C is the father of B and C has 3 children. On the basis of this information, find out which of the following relations is correct :  
 (a) C has three daughters.  
 (b) C has three sons.  
 (c) B is the son.  
 (d) None of these.
11. A man pointing to a photograph says, "The lady in the photograph is my nephew's maternal grandmother." How is the lady in the photograph related to the man's sister who has no other sister?  
 (a) Cousin                (b) Sister-in-law  
 (c) Mother                (d) Mother-in-law
12. A is the brother of B. A is the brother of C. To find what is the relation between B and C. What minimum information from the following is necessary?  
 (i) Sex of C              (ii) Sex of B  
 (a) Only (i)             (b) Only (ii)  
 (c) Either (i) or (ii)    (d) both (i) and (ii)

- DIRECTIONS (Qs. 13-17) :** are based on the following statements.
- (i) Seeta, Rajinder and Surinder are children of Mr. and Mrs. Maudgil.
  - (ii) Renu, Raja and Sunil are children of Mr. and Mrs. Bhaskar.
  - (iii) Sunil and Seeta are married and Ashok and Sanjay are their children.
  - (iv) Geeta and Rakesh are children of Mr. and Mrs. Jain.
  - (v) Geeta is married to Surinder and has three children named Rita, Sonu and Raju.

*Read above statements carefully and answer the following questions :*

13. How is Rajinder related to Raju?  
 (a) Brother               (b) Uncle  
 (c) Brother-in-law       (d) Cousin
14. How is Rajinder related to Ashok?  
 (a) Brother-in-law       (b) Father-in-law  
 (c) Causin               (d) Maternal Uncle
15. How is Rakesh related to Surinder?  
 (a) Brother               (b) Cousin  
 (c) Brother-in-law       (d) Maternal uncle
16. How is Rakesh related to Rita?  
 (a) Brother               (b) Cousin  
 (c) Uncle                (d) Maternal uncle
17. Sunil and Rakesh are related as  
 (a) Brothers              (b) Cousins  
 (c) Uncle and Cousin    (d) Brother-in-law
18. A and B are married couple. X and Y are brothers. X is the brother of A. How is Y related to B?  
 (a) Brother-in-law       (b) Brother  
 (c) Son-in-law           (d) Cousin

**DIRECTIONS (Qs. 19-22) :** Study the following information carefully to answer the questions that follow :

Adhir Mishra has three children : Urmila, Raghu and Sumit. Sumit married Roma, the eldest daughter of Mr. And Mrs. Mohan. The Mohans married their youngest daughter to the eldest son of Mr. and Mrs. Sharma and they had two children Sandeep and Shaifali. The Mohans have two more children, Roshan and Bimla, both elder to Sheila. Sohan and Shivendar are sons of Sumit and Roma. Leela is the daughter of Sandeep.

19. How is Mrs. Mohan related to Sumit ?  
 (a) Aunt                   (b) Mother-in-law  
 (c) Mother                (d) Sister-in-law
20. What is the surname of Sohan ?  
 (a) Sharma               (b) Mohan  
 (c) Mishra               (d) Raghu
21. What is the surname of Leela ?  
 (a) Sharma               (b) Mohan  
 (c) Mishra               (d) None of these
22. How is Shivendar related to Roma's father ?  
 (a) Son-in-law           (b) Cousin  
 (c) Son                   (d) Grandson

23. If  $A + B$  means A is the brother of B;  $A \div B$  means A is the father of B and  $A \times B$  means A is the sister of B, which of the following means M is the uncle of P?
- $N \times P \div M$
  - $M + S \div R \div P$
  - $M \div N \times P$
  - $M + K \div T \times P$
24. If  $P + Q$  means P is the brother of Q;  
 $P \times Q$  means P is the father of Q;  
 $P - Q$  means P is the sister of Q;  
Which of the following represents 'S is the niece of T'?
- $T \times M + S$
  - $T \times S + M$
  - $T + M \times S$
  - None of these
25.  $P \times Q$  means P is the sister of Q;  
 $P + Q$  means P is the father of Q;  
 $P - Q$  means P is the mother of Q. Which of the following means 'S is the aunt of T'?
- $T \times M + S$
  - $S + T \times M$
  - $S \times M + T$
  - $S \times M + R - T$
- DIRECTIONS (Qs. 26-28) :** Read the information given below to answer the questions that follows :
- Rama and Mohan are a married couple having two daughters named Smita and Devika. Devika is married to Aman who is the son of Madhu and Jeewan. Romila is the daughter of Aman. Krishna who is Aman's sister is married to Sunil and has two sons Anuj and Ankur. Ankur is the grandson of Madhu and Jeewan.
26. How is Krishna related to Devika ?
- Sister-in-law
  - Sister
  - Aunt
  - None of these
27. What is the relationship between Anuj and Romila?
- Uncle – Niece
  - Father – Daughter
  - Husband – Wife
  - Cousins
28. Which of the following is true ?
- Anuj is the son of Smita.
  - Romila is the cousin of Krishna.
  - Madhu is Sunil's mother-in-law.
  - Jeewan is Devika's maternal uncle.
29. A family consists of six members P, Q, R, X, Y and Z. Q is the son of R but R is not mother of Q. P and R are a married couple. Y is the brother of R. X is the daughter of P. Z is brother of P.
- Who is the brother-in-law of R?
  - How is Q related to X?
- (i) Who is the brother-in-law of R?
- P
  - Z
  - Y
  - X
- (ii) How is Q related to X?
- Husband
  - Father
  - Brother
  - Uncle
30. If  $A + B$  means A is brother of B;  
 $A - B$  means A is sister of B;  
 $A \times B$  means A is wife of B and  
 $A + B$  means A is father of B then which of the following indicates 'S is son of P'?
- $P \times Q \div R + S - T$
  - $P \times Q \div S - R + T$
  - $P \times Q \div R - T + S$
  - $P \times Q \div R - S + T$
31.  $A \$ B$  means B is father of A;  
 $A \# B$  means B is mother of A;  
 $A * B$  means B is sister of A and  
 $A @ B$  means B is husband of A; then which of the following indicates the relationship 'N is grandmother of P'?
- $P * Q \# M \$ N$
  - $P @ Q \$ M \# N$
  - $P \# Q \$ N * M$
  - None of these
32. If  $M \times N$  means M is the daughter of N;  
 $M + N$  means M is the father of N;  
 $M \div N$  means M is the mother of N and  
 $M - N$  means M is the brother of N then in the expression  $P \div Q + R - T \times K$ , how 'P is related to K'?
- Daughter-in-law
  - Sister-in-law
  - Aunt
  - None of these
33.  $P - Q$  means Q is son of P;  
 $P \times Q$  means P is brother of Q;  
 $P + Q$  means Q is sister of P and  
 $P + Q$  means P is mother of Q. Which of the following is definitely TRUE about ' $N \times K - M \div L$ '?
- 'K' is father of L and M.
  - 'L' is the daughter of 'K' and is the niece of 'N'.
  - 'K' is the father of 'M' and 'L' - his son and daughter respectively.
  - 'M' is the uncle of K's brother N.
34. If  $P \times Q$  means Q is mother of P;  
 $P + Q$  means P is brother of Q;  
 $P - Q$  means P is sister of Q and  
 $P \div Q$  means Q is father of P.
- Then, which of the following definitely means R is grandson of K?
- $R \times T + K$
  - $M + R \times T \div K$
  - $M - R \times T \div K$
  - None of these
35. Given that
- A is the mother of B
  - C is the son of A
  - D is the brother of E
  - E is the daughter of B.
- The grandmother of D is
- A
  - B
  - C
  - E
36. Deepak said to Nitin, " That boy playing football is the younger of the two brothers of the daughter of my father's wife " How is the boy playing football related to Deepak ?
- Son
  - Brother
  - Cousin
  - Niece
37. Pointing out to a lady, a girl said " she is the daughter-in-law of the grandmother of my father's only son." How is the lady related to the girl ?
- Sister-in-law
  - Mother
  - Aunt
  - Mother-in-law
38. A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C?
- Father
  - Brother
  - Grand father
  - Uncle

39. Pointing out to a photograph, a man tells his friend, " she is the daughter of the only son of my father's wife. How is the girl related to the man in the photograph?
- (a) Daughter      (b) Cousin  
 (c) Mother      (d) Sister
40. X' is the wife of 'Y' and 'Y' is the brother of 'Z', 'Z' is the son of 'P'. How is 'P' related to 'X'?
- (a) Sister      (b) Aunt  
 (c) Brother      (d) Father
41. Ajay is the brother of Vijay. Mili is the sister of Ajay. Sanjay is the brother of Rahul and Mehul is the daughter of Vijay. Who is Sanjay's Uncle?
- (a) Rahul      (b) Ajay  
 (c) Mehul      (d) Data inadequate
42. If S — T means 'S' is the wife of 'T' is S + T means 'S' is the daughter of 'T' and S + T means 'S' is the son of 'T' What will M + J + K means?
- (a) 'K' is the father of 'M'  
 (b) 'M' is the grand daughter  
 (c) 'J' is wife of 'K'  
 (d) 'K' and 'M' are brothers

**DIRECTIONS (Qs. 43-44) :** S and R are brothers. T is daughter of S. U is the spouse of R and mother of Q. P is the daughter of V, who is the spouse of T.

43. Who is the grand father of P?
- (a) U      (b) S  
 (c) R      (d) V
44. Who is the cousin of Q?
- (a) T      (b) V  
 (c) R      (d) P

**DIRECTIONS (Qs. 45-50) :** Refer to the data below and answer the questions that follows.

There are six women, Shalini, Divya, Ritu, Rashmi, Nisha and Renu in a family of twelve members. There are few married couples in the family and none of the grandchildren are married. Sunil is married into the family. Rohan, Mahesh and Jatin have a nephew Dipesh who is the only son of Rashmi. Ravi is the paternal grandfather of Nisha. Ritu is the daughter-in-law of shalini. Renu only one sister Rashmi and a sister-in-law Divya. Dipesh's only unmarried maternal uncle, jatin is the brother-in-law of sunil. Rohan is the paternal uncle of the Nisha. Ritu has two daughters one of whom is Nisha.

45. How many married couples are there in the second generation?

- (a) 1      (b) 2  
 (c) 3      (d) 4

46. Dipesh is

- (a) Mahesh's son      (b) Ravi's grandson  
 (c) Rohan's son      (d) Sunil's nephew

47. Nisha is

- (a) Rohan's Daughter      (b) Jatin's mother  
 (c) Renu's cousin      (d) None of these

48. Which one of the following is a married couple?

- (a) Rohan and Ritu      (b) Shalini and Mahesh  
 (c) Renu and Sunil      (d) Mahesh and Ritu

49. Rashmi is

- (a) Mahesh's wife      (b) Renu's aunt  
 (c) Nisha's mother      (d) None of these

50. Which of the following is true?

- (a) Dipesh is Mahesh's son.  
 (b) Ravi has only two married children  
 (c) Ravi is the paternal grandfather of Renu.  
 (d) None

51. A man pointing to a photograph says. " The lady in the photograph is my nephew's maternal grandmother" How is the lady in the photograph related to the man's sister who has no other sister.

- (a) Cousin      (b) Sister-in-law  
 (c) Mother      (d) Mother-in-law

52. Pointing to Kapil, shilpa said, His mothers's brother is the father of my son Ashish" How is kapil related to shilpa

- (a) Sister-in-law      (b) Nephew  
 (c) Niece      (d) Aunt

53. A is the uncle of B, who is the daughter of C and C is the daughter-in-law of P. How is A related to P?

- (a) Brother      (b) Son  
 (c) Son-in-law      (d) Data inadequate

54. E is the son of A. D is the son of B. E is married to C. C is B's daughter. How is D related to E?

- (a) Brother      (b) Uncle  
 (c) Father-in-law      (d) Brother-in-law

**DIRECTIONS (Qs. 55-56) :** Study the following information and answer the questions given below.

'P = Q' means Q is the father of P'

'P \* Q' means 'P' is the sister of Q'

'P ? Q' means Q is the mother of P'

'P \$ Q means P is the brother of Q'

'P Σ Q' means Q is the son of P'

'P x Q' means 'P' is the daughter of Q.'

55. Which of the following is not correct?

- (a) R x S ? T means R is the granddaughter of T.

- (b) P = Q ? R means R is the grandmother of P.

- (c) L \$ M \* O means O is the sister of L.

- (d) M \* O P Σ P = Q means Q and O are husband and wife.

56. If P \$ Q means P is the father of Q, P # Q means P is mother Q, & P \* Q means P is the sister of Q. then how is related to N if N # L \$ P \* Q

- (a) grandson      (b) grand daughter  
 (c) nephew      (d) data inadequate

57. A is the brother of B, C is the brother of A . To establish a relationship between B & C, which of the following information is required.

- I. Sex of C      II. Sex of B

- (a) Only I is required

- (b) Only II is required

- (c) Both I and II are required

- (d) Neither required

**DIRECTIONS (Qs. 59-62):**

**A + B means 'A is father of B'**

$A - B$  means 'A is wife of B'

$A \times B$  means 'A is brother of B'

$A \div B$  means ‘A is daughter of B’

59.  $P \div R + S + Q$ , which of the following is true ?  
(a) P is daughter of Q (b) Q is aunt of P  
(c) P is aunt of Q (d) P is mother of Q

60. If  $P - R + Q$ , which of the following is true  
(a) P is mother of Q (b) Q is daughter of P  
(c) P is aunt of Q (d) P is sister of Q

61.  $P \times R \div Q$ , which of the following is true ?  
(a) P is uncle of Q (b) P is father of Q  
(c) P is brother of Q (d) P is son of Q

62. If P  $\times$  R = Q, which of the following true.

  - P is brother in law of Q
  - P is brother of Q
  - P is uncle of Q
  - P is father of Q

63. Soni, who is Dubey's daughter, says to Preeti, "Your mother Shyama is the youngest sister of my father, Dubey's Father's child is Prabhat". How is Prabhat related to Preeti ?

  - Uncle
  - Father
  - Grandmother
  - Father in law

64. Pointing towards a man in the photograph, Arachana said, "He is the son of only son of my grandmother". "How is man related to Archana ?

  - Cousin
  - Nephew
  - Brother
  - Son

65. Pointing towards a woman in the photograph, Rajesh said "the only daughter of her grandfather (Paternal) is my wife". How is Rajesh related to that woman ?

  - Uncle (Fufa)
  - Father
  - Maternal uncle
  - Brother

## SOLUTIONS

1. (d) Clearly, the grandson of Anil's mother is son of Anil and wife of Anil's son is daughter-in-law of Anil. Thus, Anil is the father-in-law of the girl.

2. (c) Woman's Mother's husband

↓  
Woman's father

Woman's father's sister → Woman's Aunt.  
 Since, woman's aunt is man's aunt  
 $\therefore$  woman is sister of man.

3. (a) Father of Rajesh's brother is the father of Rajesh.  
Rajesh's father is the only son of Neha's grandfather.  
Hence, Rajesh's father is Neha's father. So, Neha is the  
sister of Rajesh.

4. (c)

```

graph TD
    Vinod((Vinod)) -- Sister --> Sister((Sister))
    Vinod -- Uncle --> Uncle((Uncle))
    Uncle -- Brother --> Brother((Brother))
    Uncle -- Daughter --> Daughter((Daughter))
    Uncle -- Brother --> Precram((Precram))
    Uncle -- Brother --> Biswali((Biswali))
    Sister -- Brother --> Bhaskar((Bhaskar))
    Bhaskar -- Daughter --> Daughter((Daughter))
    
```

Thus, Vinod will be uncle of Biswal.

5. (d) The only sister of the brother of the woman will be the woman herself and she is the mother of that man. Thus, the woman is the daughter of the maternal grandmother of that man.

6. (b) Since the narrator has no brother, his father's son is he himself. So, the man who was talking is the father of the man in the photograph, i.e. the man in the photograph is his son.

7. (b) Clearly, the speaker's brother is Pramod's maternal uncle. So, the speaker is Pramod's mother or his father's wife.

8. (b) Clearly, only daughter of her mother is woman herself.  
So, that woman is the wife of man.

9. (b) Father's wife — Mother; Mother's daughter — Sister;  
Sister's younger brother — His brother. So, the boy is  
Deepak's brother.

10. (d) A  B C  
Mother Father

∴ C has three children but we can't say that he has three daughters or three sons.

So, options (a) and (b) are incorrect.

Also, we don't know that B is a boy or girl.

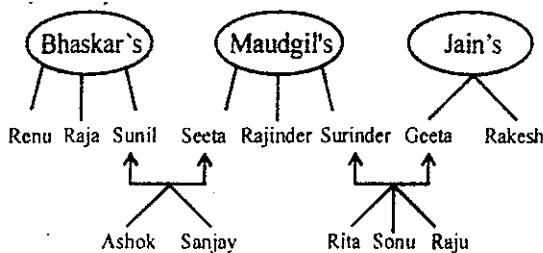
So, option (c) is also incorrect.

11. (c) Clearly, the lady is the grandmother of man's sister's son i.e., the mother of the mother of man's sister's son i.e., the mother of man's sister.

So, the lady is man's mother.

12. (d) Without knowing the sex of C, we can't be determined whether B is sister of C or B is brother of C. Similarly, without knowing the sex of B we can't be determined whether C is sister of B or C is brother of B. Therefore, both (i) and (ii) are necessary.

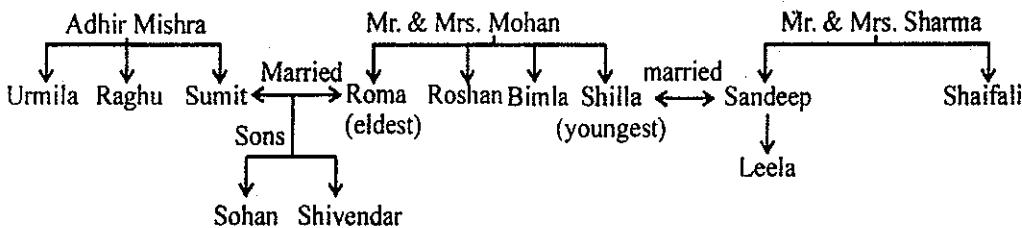
13. (b)



Raju is the son of Surinder who is the brother of Rajinder. So, Rajinder is uncle of Raju.

14. (d) Ashok is the son of Seeta whose brother is Rajinder. So, Rajinder is maternal uncle of Ashok.
15. (c) Rakesh is the brother of Geeta and Rajinder's brother is Surinder who is the husband of Geeta.
16. (d) Rita is the daughter of Geeta whose brother is Rakesh.
17. (d) Sunil's wife – Seeta  
Seeta's brother – Surinder  
Surinder's brother-in-law – Rakesh.
18. (d) X and Y are brothers and  
X is brother of A  $\Rightarrow$  Y is brother of A.  
 $\Rightarrow$  Y is brother-in-law of B.

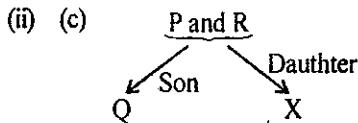
Family Tree (Q. Nos. 19 to 22) :



19. (b) Sumit's mother-in-law = Mrs. Mohan.
20. (c) As Sohan is son of Sumit and Sumit is son of Mishra. The surname of Sohan is Mishra.
21. (a) Leela is the grand daughter of Mr. Sharma. Hence, the surname of Leela is Sharma.
22. (d) Shivendar is son of Roma. Therefore, he is grandson of Roma's father.
23. (d) M is the uncle of P means M is the brother of the father (say K) of the sister (say T) of P, i.e.  $M + K \div T \times P$ .
24. (c) S is the niece of T means T is the brother of the father (say M) of S, i.e.  $T + M \times S$ .
25. (c) S is the aunt of T means S is the sister of the father (say M) of T. i.e.  $S \times M + T$ .

29. (i) (b) Q is the son of R but R is not mother of Q  
 $\Rightarrow$  R is father of Q.

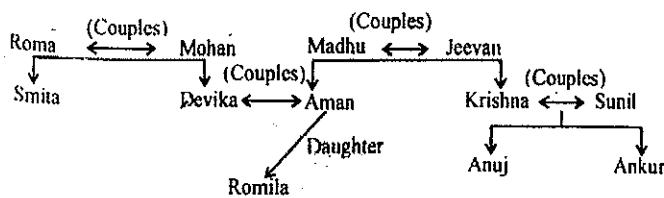
P and R are couple  $\Rightarrow$  P is female  
 $\downarrow$   
 His brother  
 $\downarrow$   
 Z, who is the  
 brother-in-law of R



$\therefore$  Q is brother of X.

29. (ii) (c) As S is female in option (a) and (b), they can be rejected directly. The sex of S in option (c) is not known, hence it can also be eliminated. Now, check option (d).  
 $P \times Q \div R - S + T$  means P is wife of Q, Q is father of R, R is sister of S and S is brother of T. i.e. S is son of P.
30. (d) N is mother of M, M is husband of Q, Q is mother of P  
 $\Rightarrow$  N is grandmother of P. i.e. P # Q @ M # N.
31. (d) P is mother of Q, Q is father of R, R is the brother of T and T is the daughter of K.  
 $\Rightarrow$  Q is the husband of K and therefore P is mother-in-law of K.
32. (d) N  $\times$  K  $- M \div L$   
 $\Rightarrow$  N is brother of K, M is son of K, L is sister of M.  
Since, we don't know the sex of K, therefore, option (a) and option (c) are not definitely true.  
Since M is son of K, therefore, option (d) is not true.  
Now, since L is sister of M, therefore, L is daughter of K. Also, N is brother of K, therefore L is niece of N.
33. (b) Reject (a) because the equation does not tell about sex of R. Reject (b) and (c) also on the same basis.

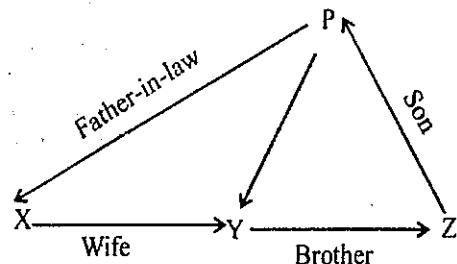
Relationship Diagram (Q. No. 26 to 28) :



There are in all four married couples.

26. (a) Since, Devika is wife of Aman and Krishna is sister of Aman, therefore, Krishna is the sister-in-law of Devika.
27. (d) Since, Anuj is son of Krishna and Romila is daughter of Aman and Aman is brother of Krishna, therefore Anuj and Romila are cousins.
28. (c) Since, Madhu is mother of Krishna who is wife of Sunil. Therefore, Madhu is Sunil's mother-in-law.

35. (a) D is the brother of E and E is the daughter of B. This means that D is the son of B. Also, A is the mother of B. So, A is the grandmother of D.
36. (b) Father's Wife — Mother; Mother's daughter — Sister Deepak's sister's younger brother—Deepak's brother.
37. (b) Girl's Father's only son—Girl's brother Grandmother of Girl's brother—Girl's Grandmother; Daughter-in-law of girl's grandmother—Girls' mother.
38. (d) Studying the statements carefully, was find that B is the brother of A and A's son is the brother of D, so D is the daughter of A. Since C and D are sister, so C is also the daughter of A. The B is the uncle of C. The answer is (d)
39. (a) Father's wife means mother ; mother's only son means himself and thus the girls is the daughter of the man.
40. (d) The relationship chart, based on the given problem can be worked out as given below.



'Y' is the brother of 'Z' who is son of "P". So, 'Z' is also the son of 'P'. When 'P' is the father of 'Y' and 'X' is the wife of 'Y' then 'P' is the father-in-law of 'X'

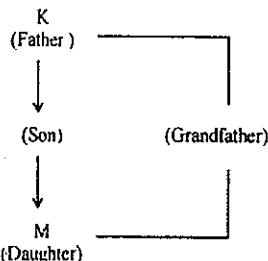
41. (d)

1. Mili  $\xrightarrow[\text{(Sister)}]{}$  Ajay  $\xrightarrow[\text{(Brother)}]{}$  Vijay  $\longrightarrow$  Mehl  
(daughter)

2. Sanjay  $\longrightarrow$  Rahul  
(brother)

There are two sets of relationship information given is incomplete and no relation can be established between the two sets.

42. (b) M + J means 'M' is the daughter of 'J'. J + K means 'J' is the son of 'K'



43. (b) P is the daughter of V, who is spouse of T. T is the daughter of S. So, T is the mother and V is the father of P. Therefore, S is the grandfather of P.

44. (a) R and S are brother Q is the child of R and T is the child of S. So, cousin of Q. is T.
45. (c) 3 married couples.
46. (b) Dipesh is Ravi grandson.
47. (d) None of the options.
48. (d) Mahesh and Ritu is the married couple.
49. (b) Rashmi is Renu's aunt.
50. (c) Ravi is the paternal grandfather of Renu.
51. (c) Clearly, the lady is the grandmother of man's sister's son i.e, the mother of the mother of man's sister's son i.e, the mother of man's sister.
52. (b) Father of shilpa's son— Shilpa's husband.  
So, kapil is the son of sister of shilpa's husband. Thus, Kapil is shilpa's nephew.
53. (b) B is the daughter of C and C is the daughter in law of P. So P is the grandfather of B. Also, A is uncle of B i.e, A is the brother of B's father. Thus, A is the son of P.
54. (d) C is B's daughter and D is B's son. So, D is the brother of C. E is a male married to C so, E is the husband of C, whose brother is D. Thus, D But D is the brother in-law of E.
55. (c) R x S ? T means R is the daughter of S whose mother is T i.e, R is the granddaughter of T.  
P = Q ? R means R is the mother of Q who is the father of P i.e, R is the grandmother of P.  
L\$M \* O means L is the brother of M who is the sister of O i.e, L is the brother of O i.e, O is the brother of sister of L.  
M \* O L P = Q means Q is the father of the son (P) of O i.e, Q is the father and O is the mother of P i.e Q and O are husband and wife.
56. (d) The sex of Q is not given hence the exact relationship between N & Q cannot be established.
57. (b) It is clear that C is the Brother of B but how B is related to C depends on the sex of B.
58. (d) The father of his brother means "his father" is the only son of my mother means "my brother" It means lady's is the father's sister of the man's father.
59. (c) 'S + Q' & 'P + S' means R is the grandfather of Q. Now P ÷ R means P is daughter of R. This clearly means P is aunt of Q.
60. (a) P – R ÷ Q, represents R is the father of Q, and P is the wife of R.  $\therefore$  P is the mother of Q
61. (d) R is the daughter of Q & P is brother of R.  
 $\therefore$  P is son of Q
62. (a) Clearly, P is related as brother in law to Q
63. (a) Preeti's mother Shyama is youngest sister of Dubey & Sister of Prabhat. Therefore Prabhat is Preeti's uncle.
64. (c) Only son of Archana's grandfather means Archana's father & his son is Archana's brother.
65. (a) Rajesh is the husband of woman's father's sister.

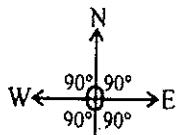
# 5

## CHAPTER

# DIRECTION-SENSE

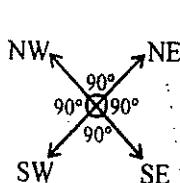
### Main Directions

1. North (N)
2. South (S)
3. East (E)
4. West (W)

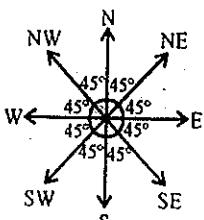


### Cardinal Directions

1. North East (NE)
2. North West (NW)
3. South East (SE)
4. South West (SW)



- ★ Angle between any two main (or cardinal) direction is  $90^\circ$  but the angle between one main and one cardinal direction is  $45^\circ$ .



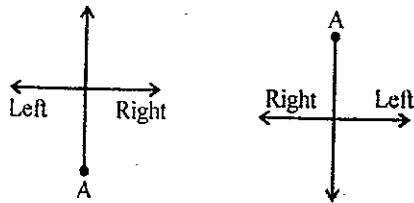
- ★ Sign for showing direction  $\rightarrow$ .

Here, the apex of an arrow tells us about the direction of movement of a point and the tail of an arrow shows the beginning of that point.

- ★ Clockwise direction (↻) - When a point moves in the direction of hands of clock, then it can be said that the point is moving in CW direction.

Anticlockwise direction (↺) - When a point moves in the opposite direction of hands of clock, then it can be said that the point is moving in ACW direction.

- ★ If 'A' is an observer then



- ⇒ To solve the question, first draw the direction figure

on paper. Mark the starting point. After that

move carefully according to the directions given in the question.

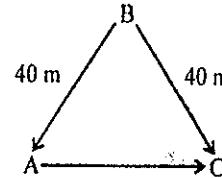
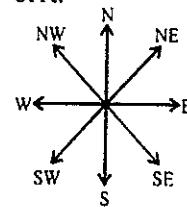
### Example 1 :

A is 40 m south-west of B. C is 40 m south-east of B. Then, C is in which direction of A?

- (a) East
- (b) West
- (c) North-east
- (d) South

### Solution :

- (a) As clear from the adjoining diagram, C lies to the east of A.



### Example 2 :

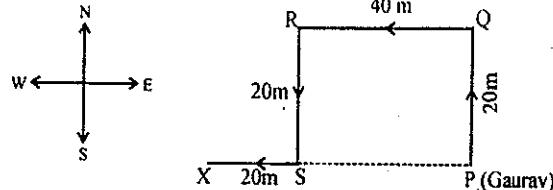
Gaurav walks 20 metres towards North. He then turns left and walks 40 metres. He again turns left and walks 20 metres. Further, he moves 20 metres after turning to the right. How far is he from his original position?

- (a) 20 metres
- (b) 30 metres
- (c) 50 metres
- (d) 60 metres

### Solution :

- (d) The movements for Gaurav are as shown in figure. Clearly, Gaurav's distance from his initial position

$$P = PX = (PS + SX) = (QR + SX) = (40 + 20) \text{ m} = 60 \text{ m}.$$



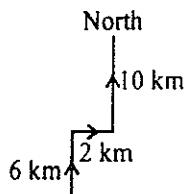
### Example 3 :

After walking 6 km, I turned right and covered a distance of 2 km, then turned left and covered a distance of 10 km. In the end, I was moving towards the north. From which direction did I start my journey?

- (a) North
- (b) South
- (c) East
- (d) West

**Solution :**

- (b) The route is as shown in the adjoining diagram.



Thus, the man started his journey from the south and moved northwards.

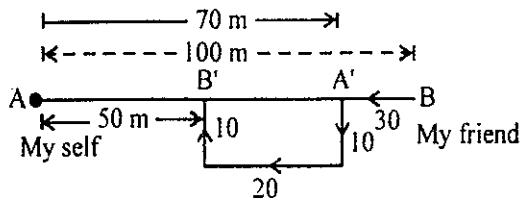
**Example 4 :**

My friend and I started walking simultaneously towards each other from two places 100 m apart. After walking 30 m, my friend turns left and goes 10 m, then he turns right and goes 20 m and then turns right again and comes back to the road on which he had started walking. If we walk with the same speed, what is the distance between us at this point of time?

- (a) 50 m                    (b) 20 m  
 (c) 30 m                    (d) 40 m

**Solution :**

- (b)



When my friend reaches on the previous track (i.e. on B') again, he had travelled a distance of  $(30 + 10 + 20 + 10) = 70$  m. As I walk with the same speed as that of my friend I have walked 70m, but on the straight track. Now, he is just  $[100 - (30 + 20)] = 50$ m from my starting point.

Hence, the distance between us  $= (70 - 50) = 20$ m

**Directions (for Examples 5 to 7) :** Read the information given below to answer these questions.

a, b, c, d, e, f, g, h and i are nine houses. c is 2 km east of b. a is 1 km north of b and h is 2 km south of a. g is 1 km west of h while d is 3 km east of g and f is 2 km north of g. i is situated just in the middle of b and c while e is just in middle of h and d.

5. Distance between e and g is :

- (a) 2 km                    (b) 1 km  
 (c) 5 km                    (d) 1.5 km

6. Distance between a and f is :

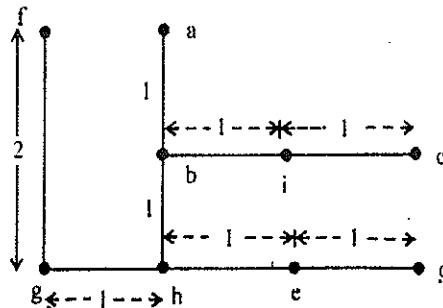
- (a) 1.41 km                (b) 3 km  
 (c) 2 km                    (d) 1 km

7. Distance between e and i is :

- (a) 4 km                    (b) 2 km  
 (c) 1 km                    (d) 3 km

**Solutions 5 to 7 :**

From the information given, positions of houses are as follows :

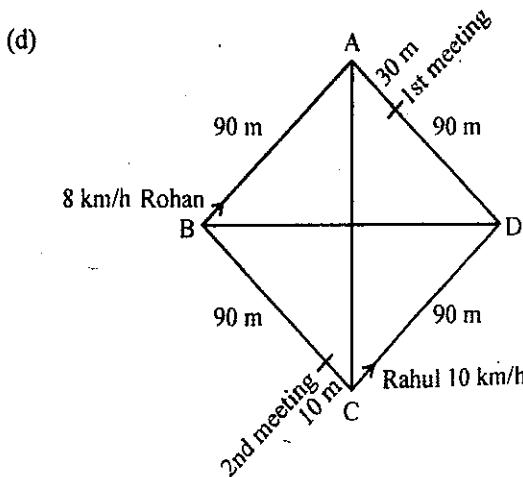


5. (a) Clearly, the distance between e and g is 2 km.  
 6. (d) From the above diagram, the distance between a and f is 1 km.  
 7. (c) Clearly, the distance between c and i is 1 km.

**Example 8 :**

A square field ABCD of side 90 m is so located that its diagonal AC is from north to south and the corner B is to the west of D. Rohan and Rahul start walking along the sides from B and C respectively in the clockwise and anti-clockwise directions with speeds of 8 km/hr and 10 km/hr. Where will they cross each other the second time?

- (a) On AD at a distance of 30 m from A  
 (b) On BC at a distance of 10 m from B  
 (c) On AD at a distance of 30 m from D  
 (d) On BC at a distance of 10 m from C

**Solution :**

Speeds of Rohan and Rahul are in the ratio 4 : 5.

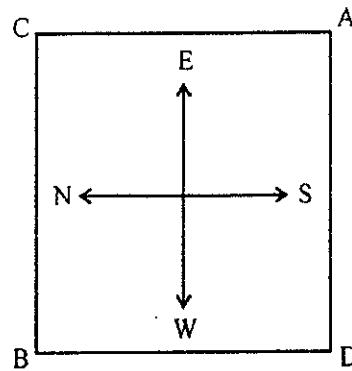
## EXERCISE

1. If A is to the south of B and C is to the east of B, in what direction is A with respect to C?
- North-east
  - North-west
  - South-east
  - South-west
2. One morning after sunrise, Gopal was facing a pole. The shadow of the pole fell exactly to his right. Which direction was he facing?
- South
  - East
  - West
  - Data inadequate
3. A boy rode his bicycle northwards, then turned left and rode one km and again turned left and rode 2 km. He found himself exactly one km west of his starting point. How far did he ride northwards initially?
- 1 km
  - 2 km
  - 3 km
  - 5 km
4. Ravi wants to go to the university. He starts from his home which is in the East and come to a crossing. The road to the left ends is a theatre, straight ahead is the hospital. In which direction is the university?
- North
  - South
  - East
  - West
5. In the given figure, P is 300 km eastward of O and Q is 400 km north of O. R is exactly in the middle of Q and P. The distance between Q and R is
- 
- (a) 250 km  
(b)  $100\sqrt{3}$  km  
(c) 500 km  
(d) 125 km
6. A rat runs 20' towards east and turns to right, runs 10' and turns to right, runs 9' and again turns to left, runs 5' and then to left, runs 12' and finally turns to left and runs 6'. Now, which direction is the rat facing?
- East
  - West
  - North
  - South
7. If South-east becomes North, North-east becomes West and so on, what will West become?
- North-east
  - North-west
  - South-east
  - South-west
8. P, Q, R and S are playing a game of carrom. P, R and S, Q are partners. S is to the right of R who is facing west. Then, Q is facing
- North
  - South
  - East
  - West
9. A and B start walking, from a point, in opposite directions. A covers 3 km and B covers 4 km. Then A turns right and walks 4 km while B turns left and walks 3 km. How far is each from the starting point?
- 5 km
  - 4 km
  - 10 km
  - 8 km
10. Anuj started walking positioning his back towards the sun. After sometime, he turned left, then turned right and then towards the left again. In which direction is he going now?
- North or South
  - East or West
  - North or West
  - South or West
11. From her home, Prerna wishes to go to school. From home, she goes towards North and then turns left and then turns right, and finally she turns left and reaches school. In which direction her school is situated with respect to her home?
- North - East
  - North - West
  - South - East
  - South - West
12. One day, Ravi left home and cycled 10 km southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. How many kilometres will he have to cycle to reach his home straight?
- 10 km
  - 15 km
  - 20 km
  - 25 km
13. Rasik walks 20 m North. Then, he turns right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Then he again turns left and walks 15 m. In which direction and how many metres away is he from his original position?
- 15 metres West
  - 30 metres East
  - 30 metres West
  - 45 metres East
14. From his house, Lokesh went 15 km to the North. Then he turned West and covered 10 km. Then, he turned South and covered 5 km. Finally, turning to East, he covered 10 km. In which direction is he from his house?
- East
  - West
  - North
  - South
15. Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to the right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?
- South-West
  - South
  - North-West
  - South-East

16. A clock is so placed that at 12 noon its minute hand points towards north-east. In which direction does its hour hand point at 1:30 pm?
- North
  - South
  - East
  - West
17. One evening before sunset two friends Sumit and Mohit were talking to each other face to face. If Mohit's shadow was exactly to his right side, which direction was Sumit facing?
- North
  - South
  - West
  - Data inadequate
18. Rohit walked 25 metres towards South. Then he turned to his left and walked 20 metres. He then turned to his left and walked 25 metres. He again turned to his right and walked 15 metres. At what distance is he from the starting point and in which direction?
- 35 metres East
  - 35 metres North
  - 40 metres East
  - 60 metres East
19. One morning after sunrise, Reeta and Kavita were talking to each other face to face at Tilak Square. If Kavita's shadow was exactly to the right to Reeta, which direction Kavita was facing?
- North
  - South
  - East
  - Data inadequate
20. I am facing east. I turn  $100^\circ$  in the clockwise direction and then  $145^\circ$  in the anticlockwise direction. Which direction am I facing now?
- East
  - North-east
  - North
  - South-west
21. A man is facing north-west. He turns  $90^\circ$  in the clockwise direction, then  $180^\circ$  in the anticlockwise direction and then another  $90^\circ$  in the same direction. Which direction is he facing now?
- South
  - South-west
  - West
  - South-east
22. A man is facing west. He runs  $45^\circ$  in the clockwise direction and then another  $180^\circ$  in the same direction and then  $270^\circ$  in the anticlockwise direction. Which direction is he facing now?
- South
  - North-west
  - West
  - South-west

- (a) The square immediately north of the rice.  
 (b) The square immediately east of the rice.  
 (c) The square immediately west of the rice.  
 (d) The square immediately north east of the rice.
23. If Batuk Singh decides to plant the wheat next to the peanuts, in which square will the barley be?
24. Which square cannot be planted with wheat?
25. Which square cannot be planted with soyabean?

**DIRECTIONS (Qs. 26-30) :** These questions based on the diagram given below showing four persons stationed at the four corners of a square piece of a plot as shown :



26. A starts crossing the plot diagonally. After walking half the distance, he turns right, walks some distance and turns left. Which direction is A facing now?
- North-east
  - North
  - North-west
  - South-east
27. From the original position given in the above figure, A and B move one arm length clockwise and then cross over to the corners diagonally opposite; C and D move one arm length anti-clockwise and cross over to the corners diagonally opposite. The original configuration ABCD has now changed to
- CDAB
  - DACB
  - BDAC
  - ACBD
28. From the original position, B and D move one and a half length of sides clockwise and anti-clockwise respectively. Which one of the following statements is true?
- B and D are both at the mid point between A and C.
  - B is at the midpoint between A and C, and D is at the corner originally occupied by A.
  - D is at the midpoint between A and C, and B is at the corner originally occupied by C.
  - B and D are both at the midpoint between A and D.
29. From the positions in the original figure, C and A move diagonally to opposite corners and then one side each clockwise and anti-clockwise respectively. B and D move two sides each clockwise and anti-clockwise respectively. Where is A now?
- At the north-west corner
  - At the south-east corner
  - At the north-east corner
  - At the south-west corner

**DIRECTIONS (Qs. 23-25) :** These questions are based on the following information.

*Farmer Batuk Singh has a larger square field divided into nine smaller square fields, all equal, arranged in three rows of three fields each. One side of the fields runs exactly east-west. The middle square must be planted with rice because it is wet. The wheat and barley should be continuous so that they can be harvested all at once by the mechanical harvester. Two of the field should be planted with soyabean. The north westernmost field should be planted with peanuts and the southern third of the field is suitable only for vegetables.*

Now select the correct answers for the following question from the codes given above.

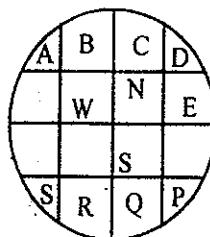
30. After the movements given in the above question, who is at the north-west corner ?  
 (a) A (b) C  
 (c) B (d) D
31. Sobha was facing East. She walked 20 metres. Turning left she moved 15 metres and then turning right moved 25 metres. Finally, she turned right and moved 15 metres more. How far is she from her starting point.  
 (a) 25 metres (b) 35 metres  
 (c) 50 metres (d) 45 metres
32. Jatin leaves his house and walks 12 km towards North. He turns right and walks another 12 km. He turns right again, walks 12 km more and turns left to walk 5 km. How far is he from his home and in which direction ?  
 (a) 7 km East (b) 10 km East  
 (c) 17 km East (d) 24 km East

**DIRECTIONS (Qs. 33-34) :** These questions are based on the information given below :

A position of four policemen A, B, C and D in a circular park which is divided into sixteen plots is shown.

P, Q, R and S are the offenders whom they have to catch after given moves. The figure shows their positions.

Note that the by-lanes are North-South and East-West.

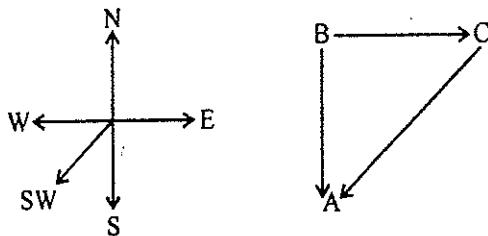


33. Who two are positioned North-West, South-East ?  
 (a) P, A (b) B, R  
 (c) S, D (d) Q, C
34. If A, B, C and D were to move clockwise four plots and P, Q, R and S were to move anti-clockwise six plots, then who two would be the north-south ?  
 (a) P, A (b) Q, B  
 (c) R, D (d) P, C.
35. Deepak starts walking straight towards east. After walking 75 metres, he turns to the left and walks 25 metres straight. Again he turns to the left, walks a distance of 40 metres straight, again he turns to the left and walks a distance of 25 metres. How far is he from the starting point ?  
 (a) 25 metres (b) 50 Metres  
 (c) 115 Metres (d) 35 Metres
36. I am facing south. I turn right and walk 20 m. Then I turn right again and walk 10 m. Then I turn left and walk 10 m and then turning right walk 20 m. Then I turn right again and walk 60 m. In which direction am I from the starting point  
 (a) North (b) North- west  
 (c) East (d) North -east

37. Ramakant walks northwards. After a while, he turns to his right and a little further to his left. Finally, after walking a distance of one kilometre, he turns to his left again. In which direction is he moving now ?  
 (a) North (b) South  
 (c) East (d) West
38. Raj travelled from a point X straight to Y at a distance of 80 metres. He turned right and walked 50 metres, then again turned right and walked 70 metres. Finally, he turned right and walked 50 metres. How far is he from the starting point  
 (a) 10 metres (b) 20 metres  
 (c) 50 metres (d) 70 metres
39. Going 50 m to the south of her house, Radhika turns left and goes another 20 m. Then turning to the North, she goes 30 m and then starts walking to her house. In which direction is she walking now ?  
 (a) North -west (b) North  
 (c) South east (d) East
40. P, Q, R, S, T, U, V W are sitting around a round table in the same order, for group discussion at equal distance. Their position are clockwise . If V sits in the north, then what will be the position of S ?  
 (a) East (b) South-east  
 (c) South (d) South-west
41. While facing East, Rohit turns to his left and walks 10 metres, then he turns left and walks 10 meters. Now he turns  $45^\circ$  towards his right and goes straight to cover 25 meters. In which direction is he from his starting point ?  
 (a) North-east (b) North-west  
 (c) South-west (d) South-east
42. If all the directions are rotated, i.e., if North is changed to West and East to North and so on, then what will come in place of North-West ?  
 (a) South-West (b) North-East  
 (c) East-North (d) East-West
43. If a person is walking towards North, what direction should he follow so that he is walking towards West ?  
 (a) right, right, left (b) left, left, right  
 (c) left, right, left (d) left, left, left
44. Two friends start a race, and together they run for 50 mts. Jack turns right and runs 60 mts while Bunny turns left and runs 40 mts. Then Jack turns left and runs 50 mts while Bunny turns right and runs 50 mts. How far are the two friends now from each other  
 (a) 60 mts (b) 20 mts  
 (c) 100 mts (d) 150 mts

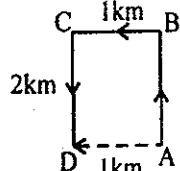
# SOLUTIONS

1. (d) Clearly, comparing the direction of A w.r.t. C in the second diagram with that in the first diagram, A will be south-west of C.

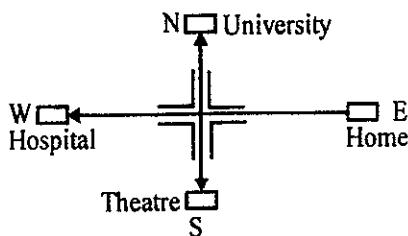


2. (a) The Sun rises in the east. So, in morning, the shadow falls towards the west. Now, shadow of pole falls to the right of Gopal. Therefore, Gopal's right side is the west. So, he is facing South.

3. (b) Clearly, the boy rode from A to B, then to C and finally up to D. Since D lies to the west of A, so required distance = AB = CD = 2 km.



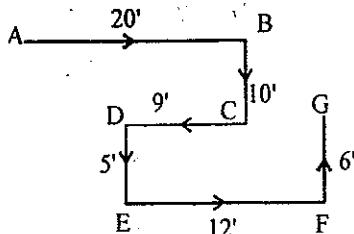
4. (a) Starting from his house in the East, Ravi moves westwards. Then, the theatre, which is to the left, will be in the South. The hospital, which is straight ahead, will be to the West. So, the University will be to the North.



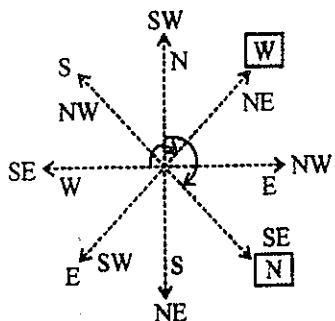
5. (a) Clearly,  $PQ = \sqrt{OP^2 + OQ^2} = \sqrt{(300)^2 + (400)^2}$   
 $= \sqrt{90000 + 160000} = 500\text{ km}$

Since, R is the midpoint of PQ, so  $QR = \frac{1}{2} \times PQ$   
 $= 250\text{ km.}$

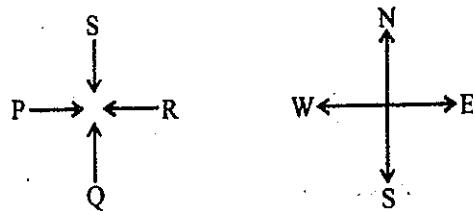
6. (c) The movements of rat are as shown in figure. Clearly, it is finally walking in the direction FG i.e. North.



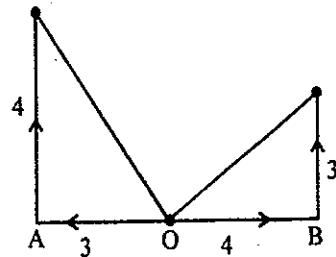
7. (c) Here, each direction moves  $90^\circ + 45^\circ = 135^\circ$



8. (a) Here, R faces towards West. S is to the right of R. So, S is facing towards South. Thus, Q who is the partner of S, will face towards North.

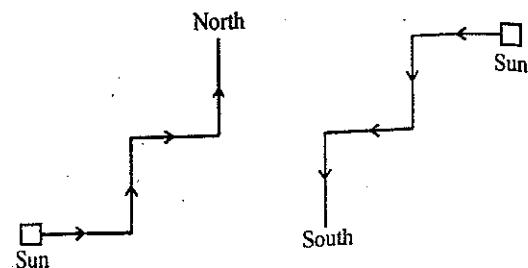


9. (a) Here, O is the starting point.

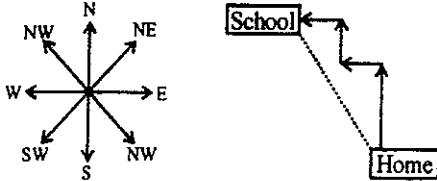


Both A and B are  $\sqrt{3^2 + 4^2} = 5\text{ km}$  from the starting point.

10. (a) Clearly, there are two possible movements of Anuj as shown below:



11. (b)



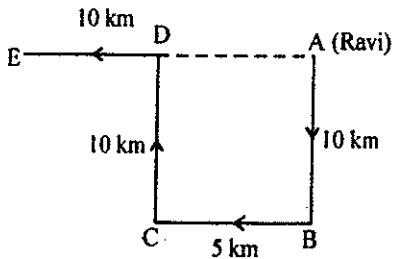
It is clear from the diagram that school is in North-west direction with respect to home.

12. (b) Here, Ravi starts from home at A, moves 10 km southwards up to B, turns right and moves 10 km up to C, turns right again and moves 10 km up to D and finally turns left and moves 10 km up to E.

Thus, his distance from initial position A = AE

$$= AD + DE$$

$$= BC + DE = (5 + 10) \text{ km} = 15 \text{ km.}$$



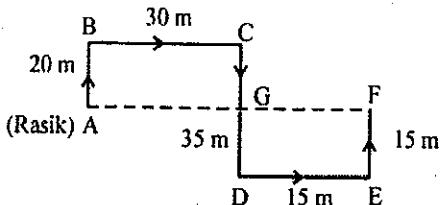
13. (d) The movements of Rasik from A to F are as shown in figure.

Since CD = AB + EF, so F lies in line with A.

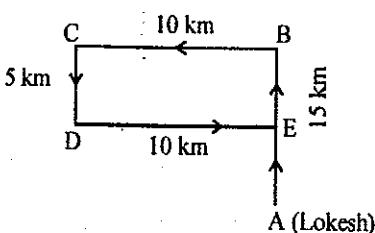
Rasik's distance from original position A = AF

$$= (AG + GF) = (BC + DE) = (30 + 15) \text{ m} = 45 \text{ m.}$$

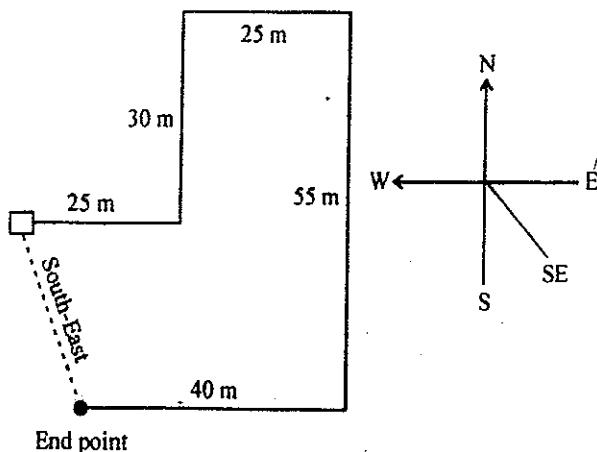
Also, F lies to the east of A.



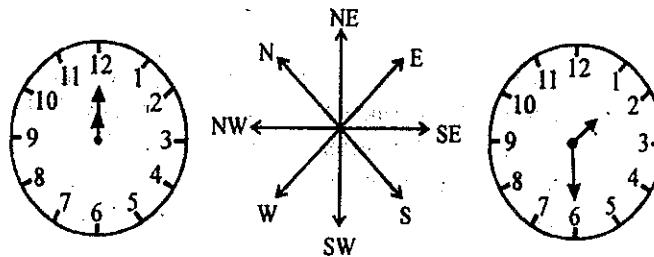
14. (c) The movements of Lokesh are as shown in figure. (A to B, B to C, C to D, D to E). Clearly, his final position is E which is to the North of his house A.



15. (d)



16. (c) The positions of the minute and hour hands at 12 noon and 1:30 p.m. are as shown in the diagram. Comparing with direction figure, we see that the hour hand at 1:30 p.m. points towards the East.



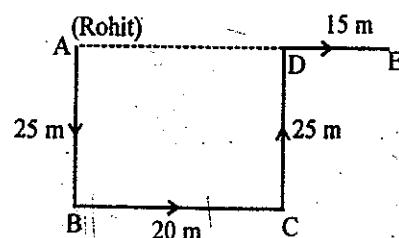
17. (b) In the evening, sun is in the west and so the shadows fall towards east. So, Mohit's shadow fell towards east. Now, since Mohit's shadow fell towards right, therefore, Mohit is facing North. So Sumit, standing face to face with Mohit, was facing South.

18. (a) The movements of Rohit are as shown in figure.

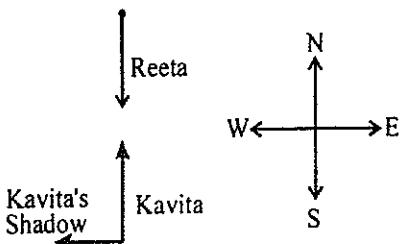
Rohit's distance from starting point A = AE

$$= (AD + DE) = (BC + DE) = (20 + 15) \text{ m} = 35 \text{ m.}$$

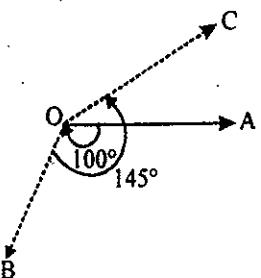
Also, E is to the East of A.



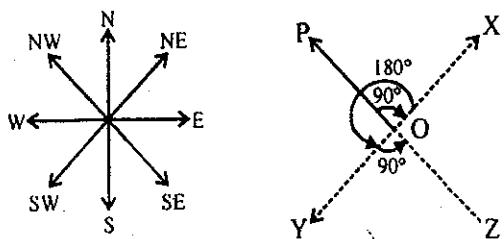
19. (a) In morning, sun rise in the east so shadow of a object falls towards the west. Now, Kavita's shadow falls to the rights of Reeta. Hence, Reeta is facing South and Kavita is facing North.



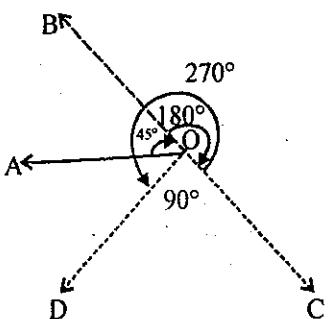
20. (b) As shown in figure, the man initially faces towards east i.e., in the direction OA. On moving  $100^\circ$  clockwise, he faces in the direction OB. On further moving  $145^\circ$  anticlockwise, he faces in the direction OC. Clearly, OC makes an angle of  $(145^\circ - 100^\circ)$  i.e.  $45^\circ$  with OA and so, the man faces in the direction North-east.



21. (d) As shown in figure, the man initially faces in the direction OP. On moving  $90^\circ$  clockwise, he faces in the direction OX. On further moving  $180^\circ$  anticlockwise, he faces in the direction OY. Finally, on moving  $90^\circ$  anticlockwise, he faces in the direction OZ, which is South-east.



22. (d) Clearly, the man initially faces in the direction OA. On moving  $45^\circ$  clockwise, he faces in the direction OB. On further moving  $180^\circ$  clockwise, he faces in the direction OC. Finally, on moving  $270^\circ$  anticlockwise, he faces in the direction OD, which is South-west. Hence, the answer is (d).

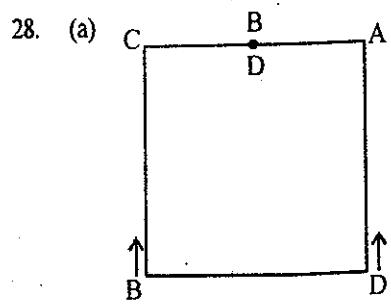
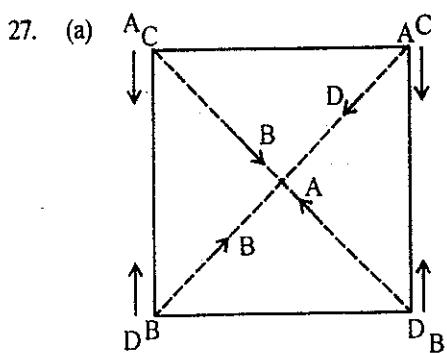
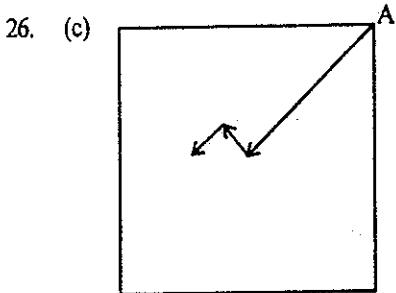


### Solutions 23 to 25 :

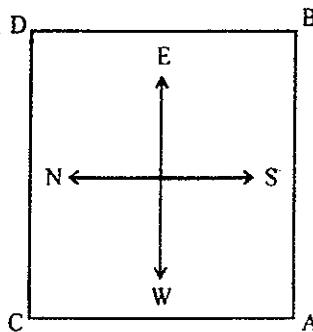
Peanuts		
	Rice	
		Vegetable

23. (d) Since Wheat and Barley should be continuous, therefore, Barley will be planted in the square immediately north east of the rice field.
24. (c) The square immediately west of the rice field cannot be planted with wheat.
25. (d) The square immediately north east of the rice square cannot be planted with soyabean.

### Solutions 26 to 30.

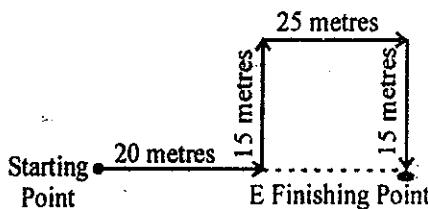


29. (d) As per directions given in the questions, the new figure formed is as follows :



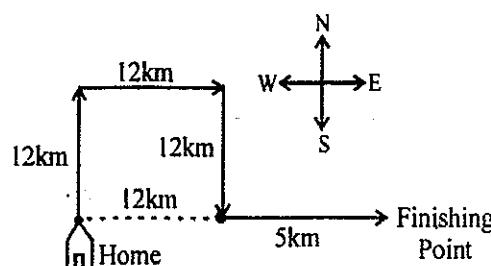
30. (b) It is clear from above diagram

31. (d)

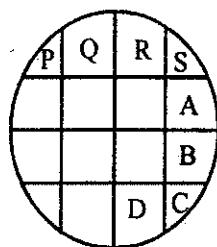


Shobha turns left after walking 20 metres towards East. Now she walks 15 metres towards North. She turns right towards East again and walks 25 metres further. Finally turning right towards South, she walks 15 metres. The distance moved towards North and towards South is same, i.e., 15 metres. So, Shobha is  $20 + 25$  metres = 45 metres away from her starting point.

32. (c) ( $12 \text{ km} + 5 \text{ km} = 17 \text{ km}$ )

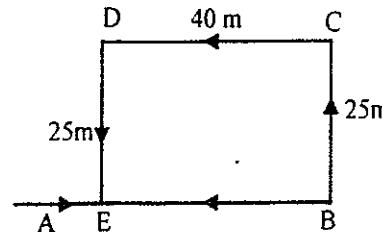


33. (d) A is positioned north-west and P is positioned south-east.



34. (c)

35. (d) The movements of Deepak are as shown in fig.

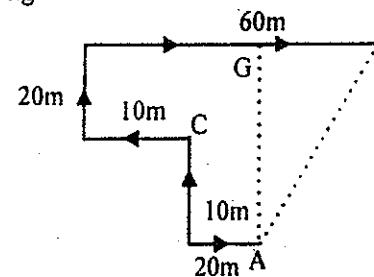


$$\text{Clearly, } FB = DC = 40 \text{ m.}$$

$\therefore$  Deepak's distance from the starting point A

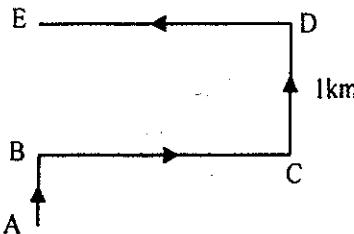
$$= (AB - EB) = (75 - 40) \text{ m} = 35 \text{ m.}$$

36. (d) The movements of the person are from A to F, as shown in fig.



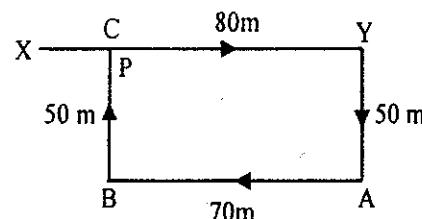
Clearly, the final position is F which is to the north east of the starting point A.

37. (d) The movements of Ramakant are as shown in fig.



Clearly he is finally walking in the direction DE i.e, west

38. (a) The movements of Raj are as shown in fig (X to Y, Y to A, A to B, B to C).



$\therefore$  Raj's distance from the starting point

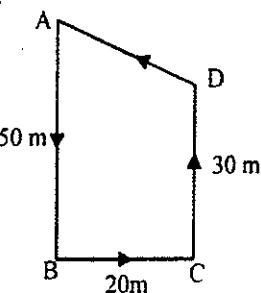
$$= XC = (XY - YC) = (XY - BA)$$

$$= (80 - 70) \text{ m} = 10 \text{ m.}$$

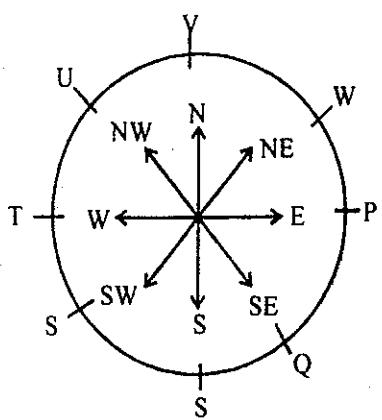
39. (a) The movements of Radhika

are as shown in fig  
(A to B, B to C, C to D  
and D to E)

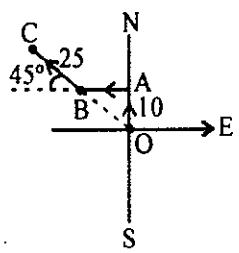
Clearly she is finally moving in  
the direction DA i.e., north west.



40. (d) Clearly, the seating arrangement is as shown in the adjoining figure. So, S is at the south-west position.



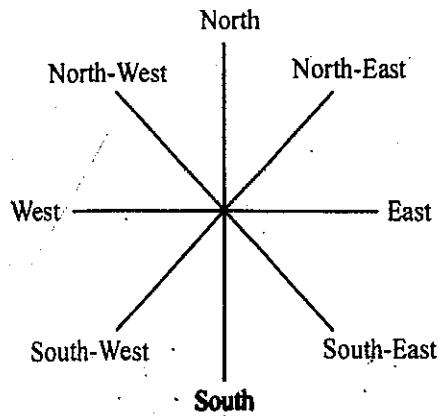
41. (b) Rohit originally is facing but he turns to his left from O. Here onwards his travel plans are shown in the diagram.



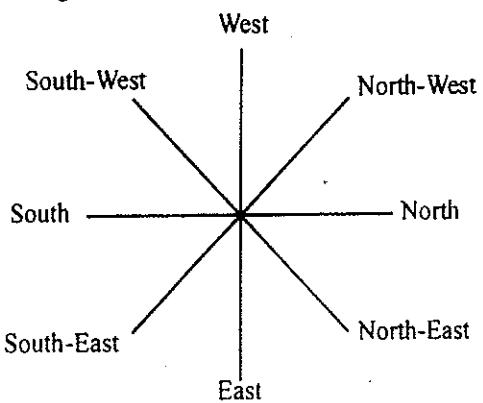
He is finally at C which is North-west with respect to his starting point O.

42. (a)

Original directions

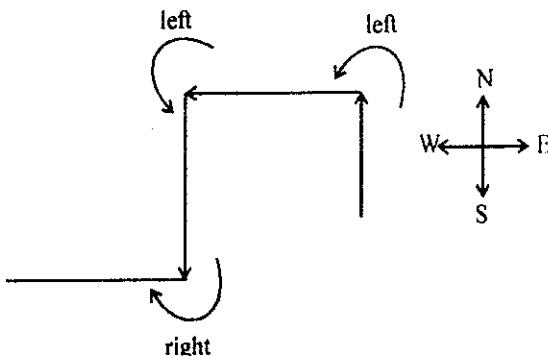


### Changed directions



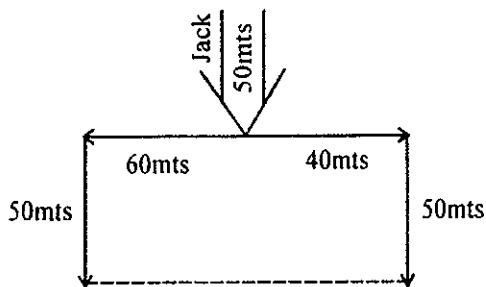
43. (c)

The directions to be followed will be :



44. (c)

The track of both the friends is



Two friends are  $60 + 40 = 100$  mts apart

OOO

# 6

## CHAPTER

# RANKING TEST

The position of a thing/person etc. in a definite order is called as 'Rank'.

- ★ Position of person from upward  
= [Total no. of persons – position of person from down] + 1.
- ★ Position of person from downward  
= [Total no. of persons – position of person from up] + 1.
- ★ Position of person from right  
= [Total no. of persons – position of person from left] + 1.
- ★ Position of person from left  
= [Total no. of persons – position of person from right] + 1.

### Example 1 :

Aruna ranks twelfth in a class of forty six. What will be her rank from the last?

### Solution :

Rank of Aruna from the last = [Total student – her rank from first] + 1 =  $(46 - 12) + 1 = 35$ th.

### Example 2 :

Ravi is 7 ranks ahead of Sumit in a class of 39. If Sumit's rank is 17th from the last, what is Ravi's rank from the start?

### Solution :

Rank of Ravi from the last =  $17 + 7 = 24$ th.

$\therefore$  Rank of Ravi from the start =  $(39 - 24) + 1 = 16$ th.

### Example 3 :

In a class of 35 students Kiran is placed 7<sup>th</sup> from the bottom whereas Sohan is placed 9<sup>th</sup> from the top. Mohan is placed exactly in between the two. What is Kiran's position from Mohan ?

- (a) 10                                  (b) 11  
(c) 13                                    (d) 12

### Solution :

(a) Position of Kiran from the top  
 $= [35 - 7] + 1 = 29$ th

Position of Sohan from the top = 9<sup>th</sup>.

Difference of their positions =  $29 - 9 = 20$

$\therefore$  Mohan's position from top =  $9 + 10 = 19$ th

Hence, Kiran's position from Mohan =  $29 - 19$   
= 10th

- ★ Total no. of persons  
= [Position of person from upward/right + Position of person from downward/left] – 1.

### Example 4 :

Sonal ranks 7<sup>th</sup> from the top and 28<sup>th</sup> from the bottom in a class. How many students are there in the class?

### Solution :

Total no. of students =  $[7 + 28] - 1 = 34$ .

### Example 5 :

Manish ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six boys did not participate in the competition and five failed in it. How many boys were there in the class?

### Solution :

Total no. of students =  $[(16 + 29) - 1] + 6 + 5 = 55$ .

- ★ If two persons are on a definite position from up and down (or left and right) and they interchange their ranks, then
  - (A) Total no. of persons in order  
= [first position of first person + second position of second person] – 1
  - (B) Second position of first person or second position of second person = Difference of two positions of second person + First position of second person.  
= Difference of two positions of first person + First position of second person.

### Example 6 :

In a row of girls, Shilpa is eighth from the left and Reena is seventeenth from the right. If they interchange their positions, Shilpa becomes fourteenth from the left. How many girls are there in the row?

**Solution :**

$$\begin{aligned}\text{Total no. of girls} \\ &= [\text{Second position of Shilpa} + \text{First position of Reena}] - 1 \\ &= (14 + 17) - 1 = 30\end{aligned}$$

**Example 7 :**

In a square of children, Kashish is fifth from the left and Mona is sixth from the right. When they interchange their places among themselves, Kashish becomes thirteenth from

the left. Then, what will be Mona's position from the right?

- |         |          |
|---------|----------|
| (a) 4th | (b) 14th |
| (c) 8th | (d) 15th |

**Solution :**

$$\begin{aligned}\text{(b) Second position of Mona} &= \text{Difference of two positions} \\ &\quad \text{of Kashish} + \text{First position} \\ &\quad \text{of Mona} \\ &= (13 - 5) + 6 = 14\text{th}\end{aligned}$$

## EXERCISE

1. Vijay's position is 14th from upwards in a class of 43 students. What will be his position from downwards?  
(a) 30th                   (b) 28th  
(c) 29th                   (d) 31st
2. Rakesh is on 9th position from upwards and on 38th position from downwards in a class. How many students are in class?  
(a) 47                   (b) 45  
(c) 46                   (d) 48
3. Sarita is on 11th place from upwards in a group of 45 girls. If we start counting from downwards, what will be her place?  
(a) 36th                   (b) 34th  
(c) 35th                   (d) Can not be determined
4. Raman is 9th from downwards in a class of 31 students. What will be his position from upwards?  
(a) 21st                   (b) 22nd  
(c) 23rd                   (d) 24th
5. Some boys are sitting in a line. Mahendra is on 17th place from left and Surendra is on 18th place from right. There are 8 boys in between them. How many boys are there in the line?  
(a) 43                   (b) 42  
(c) 41                   (d) 44
6. In a line of boys, Ganesh is 12th from the left and Rajan is 15th from the right. They interchange their positions. Now, Rajan is 20th from the right. What is the total no. of boys in the class?  
(a) 30                   (b) 29  
(c) 32                   (d) 31
7. In a queue, Vijay is fourteenth from the front and Jack is seventeenth from the end, while Mary is in between Vijay and Jack. If Vijay be ahead of Jack and there be 48 persons in the queue, how many persons are there between Vijay and Mary?  
(a) 8                   (b) 7  
(c) 6                   (d) 5
8. Malay Pratap is on 13th position from the starting and on 17th position from the end in his class. He is on 8th position from the starting and on 13th position from the end among the students who passed. How many students failed?  
(a) 7                   (b) 8  
(c) 9                   (d) Can not be determined
9. In a row of students, Ramesh is 9th from the left and Suman is 6th from the right. When they both interchange their positions then Ramesh will be 15th from the left. What will be the position of Suman from the right?
10. In a row of children, Bhusan is seventh from the left and Motilal is fourth from the right. When Bhusan and Motilal exchange positions, Bhusan will be fifteenth from the left. Which will be Motilal's position from the right?  
(a) Eighth               (b) Fourth  
(c) Eleventh           (d) Twelfth
11. In a line of students Madhukar is on 15th position from right and Dhirendra is on 18th position from left. When they both interchange their positions then Madhukar is on 20th position from right. What will be the position of Dhirendra from left?  
(a) 18th                   (b) 24th  
(c) 23rd                   (d) 20th
12. In a class of 45 students, among those students who passed, Anmol secured 11th position from upwards and 15th from downwards. How many students failed?  
(a) 19                   (b) 20  
(c) 15                   (d) 18
13. In a row at a bus stop, A is 7th from the left and B is 9<sup>th</sup> from the right. Both of them interchange their positions and thus A becomes 11th from the left. How many people are there in that row?  
(a) 18                   (b) 19  
(c) 20                   (d) 21
14. In a row of boys facing the North, A is sixteenth from the left end and C is sixteenth from the right end. B, who is fourth to the right of A, is fifth to the left of C in the row. How many boys are there in the row?  
(a) 39                   (b) 40  
(c) 41                   (d) 42
15. In a class of 60, where girls are twice that of boys, Kamal ranked seventeenth from the top. If there are 9 girls ahead of Kamal, how many boys are after him in rank?  
(a) 3                   (b) 7  
(c) 12                   (d) 23
16. Ravi is 7 ranks ahead of Sumit in a class of 39. If Sumit's rank is seventeenth from the last, what is Ravi's rank from the start?  
(a) 14th                   (b) 15th  
(c) 16th                   (d) 17th

17. In a queue, A is eighteenth from the front while B is sixteenth from the back. If C is twentieth from the front and is exactly in the middle of A and B, then how many persons are there in the queue ?  
 (a) 45                  (b) 46  
 (c) 47                  (d) 48
18. In a row of 21 girls, when monika was shifted by four place towards the right, she became 12 th from the left end. What was her earlier positions from the right end of the row ?  
 (a) 9th                (b) 10th  
 (c) 11th              (d) 14th
19. In a row of girls . Rita and monika occupy the ninth place from the right end and tenth place from the left end respectively. If the interchange their places, then Rita and monika occupy seventh place from the right and eighteenth place from the left respectively How many girls are there in the row ?  
 (a) 25                (b) 26  
 (c) 27                (d) Data inadequate
20. Ram and Sham are ranked 13th and 14th respectively in a class of 23. What are their ranks from the last respectively?  
 (a) 10th : 11th      (b) 11th; 12th  
 (c) 11th ; 10th       (d) None of these
21. In a row of 40 girls, when Komal was shifted to her left by 4 places her number from the left end of the row became 10. What was the number of Swati from the right end of the row if Swati was three places to the right of komal's original positions. ?  
 (a) 22                (b) 23  
 (c) 25                (d) 24
22. Manisha ranked sixteenth from the top and twenty-ninth from the bottom among those who has passed an examination. Six boys did not participate in the examination and five failed in it. How many boys were there in the class.?  
 (a) 40                (b) 44  
 (c) 50                (d) 55
23. In the first and second digits in the sequence 5 9 8 13 2 7 4 3 8 are interchanged. Also the third and fourth digits, the fifth and sixth digits and so on, which digit would be the seventh counting to your left ?  
 (a) 1                 (b) 4  
 (c) 7                 (d) 8
24. Raman is 7 ranks ahead of Suman in a class of 39. If Suman's rank is seventeenth from the last. What is Raman's rank from the start ?  
 (a) 14th              (b) 15th  
 (c) 16th              (d) 17th
25. Mohan and Ramesh are ranked seventh and eleventh respectively from the top in a class of 41 students. What will be their respective ranks from the bottom in the class  
 (a) 30th and 34th    (b) 34th and 30th  
 (c) 35th and 31st    (d) 36th and 32nd
26. Roshan ranked 11 th from the top and thirty one from the bottom in a class . How many students are there in the class?  
 (a) 42                (b) 43  
 (c) 41                (d) 40
27. If you count 21 letters in the english alphabet from the end and 20 letters from the beginning, which letter will exactly appear in the middle of the sequence thus formed?  
 (a) N                (b) L  
 (c) K                (d) M
28. Ravi is 7 ranks ahead of sumit in a class of 39. It Sumit's rank is seventeenth from the last, what is Ravi's rank from the start  
 (a) 14th              (b) 15th  
 (c) 16th              (d) 17th
29. How many numbers from 1 to 100 are there each of which is not only exactly divisible by 4 but also has 4 as a digit?  
 (a) 7                (b) 10  
 (c) 20               (d) 21
30. Manish is fourteenth from the right end in a row of 40 boys. What is his position from the left end ?  
 (a) 24th              (b) 25th  
 (c) 26th              (d) 27th

**DIRECTIONS (Qs. 31-33) :** Five persons are sitting in a row. One of the two persons at the extreme ends is intelligent and other one is fair. A fat person is sitting to the right of a weak person. A tall person is to the left of the fair person and the weak person is sitting between the intelligent the and the fat person.

31. Tall person is at which place counting from right ?  
 (a) First              (b) Second  
 (c) Third              (d) Fourth
32. Person to the left of weak person possesses which of the following characteristics?  
 (a) Intelligent       (b) Fat  
 (c) Fair               (d) Tall
33. Which of the following persons is sitting at the centre?  
 (a) Intelligent       (b) Fat  
 (c) Fair               (d) Weak
34. Sunita ranked 11 th from the top and 27th from the bottom in a class. How many student are in the class ?  
 (a) 38                (b) 28  
 (c) 40                (d) 37
35. In a row of boys, Suresh is seventh from the left and Rohit is twelfth from the right. If they interchange their positions, Suresh becomes twenty- second from the left. How many boys are there in a row ?  
 (a) 19                (b) 31  
 (c) 33                (d) Cannot be found
36. In a queue, Vijay is fourteenth from the front and jack is seventeenth from the end, while Mary is in between Vijay and Jack. If vijay be ahead of Jack and there be 48 persons in the queue, How many persons are there between vijay and Mary ?  
 (a) 8                 (b) 7  
 (c) 6                 (d) 5

**Directions (Question 37-40) :** Read the following information carefully and answer the question that follow :

Six boys A, B, C, D, E and F are marching in a line. They are arranged according to their height, the tallest being at the back and the shortest in front,

F is between B and A.

E is shorter than D but taller than C who is taller than A.

E and F have two boys between them.

A is not the shortest among them.

37. Where is E?

- (a) Between A and B
- (b) Between C and A
- (c) Between D and C
- (d) In front of C

38. Who is the tallest?

- (a) B (b) D
- (c) F (d) A

39. If we start counting from the shortest, which boy is fourth one in the line?

- (a) E (b) A
- (c) D (d) C

40. Who is the shortest?

- (a) C (b) D
- (c) B (d) F

43. Who is sitting to the right of E?

- (a) A (b) C
- (c) D (d) None of these

44. Which of the following pairs of people are sitting at the extreme ends?

- (a) AB (b) AE
- (c) CB (d) Cannot be determined

45. Name the person who should change places with C such that he gets the third place from the north end.

- (a) E (b) F
- (c) G (d) D

46. Immediately between which of the following pairs of people is D sitting?

- (a) AC (b) AF
- (c) CE (d) CF

47. Which of the conditions (i) to (v) given above is not required to find out the place in which A is sitting?

- (a) (i) (b) (ii)
- (c) (iii) (d) All are required

**DIRECTION (Qs. 41-42) :** Read the following information to answer the questions given below:

- (i) Five boys are standing in a line facing the wall wearing red, green, yellow, white and blue dress.
  - (ii) The yellow-dressed boy is not standing at any end of the line.
  - (iii) The red-dressed boy is not standing at any end of the line.
41. The boy in the middle wears which coloured-dress?

- (a) Green
- (b) Blue
- (c) Either Green or Blue
- (d) Cannot be determined

42. Who is to the right of yellow-dressed boy?

- (a) Data inadequate (b) White
- (c) Green (d) Blue

**DIRECTION (Qs. 43 - 47) :** Study the given information carefully and answer the questions that follow:

- (i) A, B, C, D, E, F and G are sitting on a wall and all of them are facing east.
- (ii) C is on the immediate right of D.
- (iii) B is at an extreme end and has E as his neighbour.
- (iv) G is between E and F.
- (v) D is sitting third from the south end.

**DIRECTIONS (Qs. 48-49) :** Read the following information carefully and answer the questions that follow:

A, B, C, D, E and F are seated in a circle facing the centre. D is between F and B. A is second to the left of D and second to the right of E.

48. Who is facing A?

- (a) B (b) D
- (c) F (d) Either F or B

49. Who among the following is facing D?

- (a) A (b) C
- (c) E (d) Cannot be determined

50. Five boys took part in a race. Raj finished before Mohit but behind Gaurav. Ashish finished before Sanchit but behind Mohit. Who won the race?

- (a) Raj (b) Gaurav
- (c) Mohit (d) Ashish

51. Asha, Babita, Chinni, Deepa, Evita and Fatima are standing in a row. Babita is between Fatima and Deepa. Evita is between Asha and Chinni. Asha does not stand next to either Fatima or Deepa. Chinni does not stand next to Deepa. Fatima is between which of the following pairs of persons?

- (a) Babita and Chinni (b) Chinni and Deepa
- (c) Asha and Chinni (d) Asha and Babita

## SOLUTIONS

1. (a) Vijay's position from downwards

$$= [\text{Total students} - \text{Vijay's position from upwards}] + 1 \\ = [43 - 14] + 1 = 30\text{th}$$

2. (c) Total students

$$= [\text{Rakesh's position from upwards} + \text{Rakesh's position from downwards}] - 1 \\ = [9 + 38] - 1 = 46$$

3. (c) Sarita's place from downwards

$$= \left[ \frac{\text{Total girls}}{\text{from upwards}} - \frac{\text{Sarita's place}}{\text{from upwards}} \right] + 1 = [45 - 11] + 1 = 35\text{th}$$

4. (c) Raman's position from upwards

$$= \left[ \frac{\text{Total students}}{\text{from down}} - \frac{\text{Raman's position}}{\text{from down}} \right] + 1 \\ = [31 - 9] + 1 = 23\text{rd}$$

5. (a) Total boys

$$= \left[ \begin{array}{l} \text{Mahendra's place from left} \\ + \text{Surendra's place from right} \end{array} \right] + \left[ \begin{array}{l} \text{Boys between them} \end{array} \right]$$

$$=[17+18]+8=43$$

6. (d) Total students

$$=[\text{First position of Ganesh} + \text{Second position of Rajan}] - 1$$

$$=[12+20]-1=31$$

7. (b) Number of persons between Vijay and Jack =  $48 - (14 + 17) = 17$

Now, Mary lies in middle of these 17 persons i.e., at the eighth position.

So, number of persons between Vijay and Mary = 7.

8. (c) Total boys

$$=[\text{Malay's place from starting} + \text{Malay's place from end}] - 1$$

$$=[13+17]-1=29$$

Number of passed students

$$=[\text{Malay's place from starting} + \text{Malay's place from end}] - 1$$

$$=[8+13]-1=20$$

$$\therefore \text{Number of failed students} = 29 - 20 = 9$$

9. (a) Position of Suman from right

$$= \left[ \begin{array}{l} \text{Difference of Ramesh's position} \\ + \text{First position of Suman} \end{array} \right]$$

$$=[(15-9)+6]=12\text{th}$$

10. (d) After exchanging positions, Bhusan becomes fifteenth instead of seventh from the left, it means there are 7 students between them. So Motilal's position from the right will become twelfth. [i.e.,  $(15-7)+4=12$ ]

11. (c) Second place of Dhirendra from left

$$= \left[ \begin{array}{l} \text{Difference of places of Madhukar} \\ + \text{First place of Dhirendra} \end{array} \right]$$

$$=[(20-15)+18]=23\text{rd}$$

12. (b) Failed Students

$$=[\text{Total students}] - [(\text{Anmol's position from upwards}) + (\text{Anmol's position from downwards}) - 1]$$

$$=45 - [(11+15)-1] = 20$$

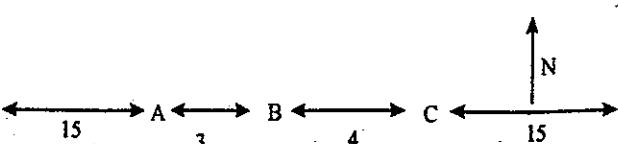
13. (b) After interchanging their positions, position of A from left = 11

then positions of A from right = 9.

$\therefore$  The total no. of people in the row

$$=(9+11)-1=19.$$

14. (b)



Clearly, according to the given conditions, there are 15 boys to the left of A, as well as to the right of C. Also, B lies between A and C such that there are 3 boys between A and B and 4 boys between B and C. So, number of boys in the row =  $(15+1+3+1+4+1+15)=40$ .

15. (c) Let the number of boys be x.

Then, number of girls =  $2x$ .

$$\therefore x+2x=60 \text{ or } 3x=60 \text{ or } x=20.$$

So, number of boys = 20 and number of girls = 40.

Number of students behind Kamal in rank  $(60-17)=43$ .

Number of girls ahead of Kamal in rank = 9.

Number of girls behind Kamal in rank =  $(40-9)=31$

$\therefore$  Number of boys behind Kamal in rank =  $(43-31)=12$ .

16. (c) Sumit is 17th from the last and Ravi is 7 ranks ahead of sumit. So, Ravi is 24th from the last.

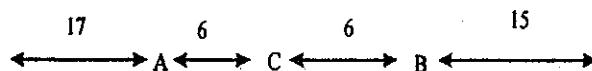
Number of students ahead of Ravi in rank =  $(39-24)=15$ .

So, Ravi is 16th from the start.

17. (c) A is 18th from front and C is 24th

Number of persons between A and C = 6.

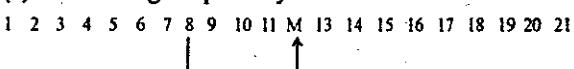
Since C is exactly in middle of A and B, so number of persons between C and B = 6.



$\therefore$  Number of persons in the queue

$$=(17+1+6+1+6+1+15)=47.$$

18. (d) The change of place by Monika can be shown as under.

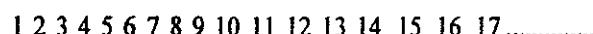


Clearly, Monika's earlier position was 8th from the left and 14th from the right end.

19. (b) Since Rita and Monika exchange places, so Rita's new position is the same as Monika's earlier positions. This position is 17th from the right and 10th from the left  
 $\therefore$  Number of girls in the row =  $(16+1+9)=26$ .

20. (c) Rank of Ram from the last =  $23-13+1=11$   
and Rank of Shyam from the last =  $23-14+1=10$

21. (d) On shifting 4 to the left Komal is 10th from the left end of the row. Thus, komal's original position was 14th from the left end.



K  $\leftarrow$  K  $\rightarrow$  S



Swati is 3 places to the right of Komal's original position.

Clearly, swati is 17th from the left end.

Number of girls to the right of swati =  $(40-17)=23$ .

Thus, Swati is 24th from the right end of the row.

22. (d) Number of boys who passed =  $16+29-1=44$

$\therefore$  Total number of boys in the class =  $44+6+5=55$

23. (d) The new sequence becomes 9 5 1 8 2 3 4 7 8 3 counting to the left, the seventh number is 8.

24. (c) Suman is 17th from the last and Raman is 7 ranks ahead of Suman. So Raman is 24 th from the last.

$\therefore$  Raman rank from the start is  $39+1-24$  i.e, 16th

25. (c) Rank of Mohan from the bottom =  $(41 + 1) - 7 = 35$  th.  
Rank of Ramesh from the bottom =  $(41 + 1) - 11 = 31$  st.
26. (c)  $T_r = 11, B_r = 31$   
 $\Rightarrow$  no. of students =  $T_r + B_r - 1 = 11 + 31 - 1 = 41$
27. (d) By counting 21 letters from the end and 20 letters from the beginning we get the following sequence  
F G H I J K L M N O P Q R S T  
Obviously, the letter M appears exactly in the sequence formed.
28. (c) Sumit is 17th from the last and Ravi is 7 rank ahead of sumit, so Ravi is 24th from the last.
29. (a) The numbers from 1 to 100 which are exactly divisible by 4 are 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100.  
But each number should have 4 as its digit.  
The required numbers are 4, 24, 40, 44, 48, 64, 84.  
Clearly, there are 7 such numbers.
30. (d) Clearly, number of boys towards the left of Manish =  $(40 - 14) = 26$ .  
So, Manish is 27th from the left end.
- 31-33 Information given in the question that one of the two person at the extreme ends is intelligent and other one is fair, suggests two conditions as shown in fig. (1) and (2).
- Fair      Intelligent      Intelligent      Fair  
|---|---|---|---|---|---|---|---|  
Fig (1)                          Fig (2)
- Information that a tall person is sitting to the left to the left of fair person rules out the possibility of fig. (1) as no person in fig.(1) can sit to the left of fair person. Therefore, only fig. (2) shows the correct positions of intelligent and fair persons. Now rest of the information regarding the position of other person can easily be inserted. The final ranking of their sitting arrangement is as shown in fig. (3).
- Intelligent      Weak      Fat      Tall      Fair  
|---|---|---|---|---|  
Fig (3)
31. (b)  
32. (a)  
33. (b)  
34. (d)  $T_r = 11, B_r = 27$ .  
 $\therefore$  Number of students in the class =  $11 + 27 - 1 = 37$ .
35. (c) Suresh's new position is 22nd from left. But it is the same as Rohit's earlier position which is 12th from right.  
 $\Rightarrow$  The number of persons in a row.  
 $= (22 + 12 - 1) = 33$
36. (a) Number of persons between vijay and jack =  $48 - (14 + 17) = 17$   
Now, mary lies in the middle of these 17 persons i.e, at the ninth positions.
- 37-40 Number of persons between Vijay and Mary = 8  
According to the information provided, the order in which the boys stand according to their heights is as follows:
- ↑  
↑  
↑  
↑  
↑  
↑  
↑  
↑  
Tallest D E C A F B Shortest
37. (c) Clearly, from the above diagram, E is between D and C.  
38. (b) D is the tallest.  
39. (d) Counting from the shortest, C is the fourth one in the line.  
40. (c) Clearly, from the above diagram, B is the shortest.  
41. (d) Cannot be determined  
42. (a) Data inadequate
- 43-47 C is to the right of D and D is third from south. So, B will be at the extreme end from north because it should have E as its neighbour. G is between E and F. So the sequence is:
- B  
E  
G  
F  
D  
C  
A
- N  
→ E
43. (d) G is sitting to the right of E.  
44. (a) A and B are sitting at the extreme ends.  
45. (c) G should change place with C to make it third from north.  
46. (d) D is sitting between C and F.  
47. (d) All the statements are required to determine the place of A.
48. (d)
- B  
E  
C  
A  
D  
F  
OR  
F  
E  
C  
A  
D  
B
- So, either F or B is facing A.
49. (b) C is facing D.  
50. (b) Gaurav – Raj – Mohit – Ashish – Sanchit.  
Hence Gaurav won the race.
51. (a) The order in which the women stand in the row is as follows.  
Asha, Evita, Chinni, Fatima, Babita, Deepa.  
Thus, Fatima is between Babita and Chinni.

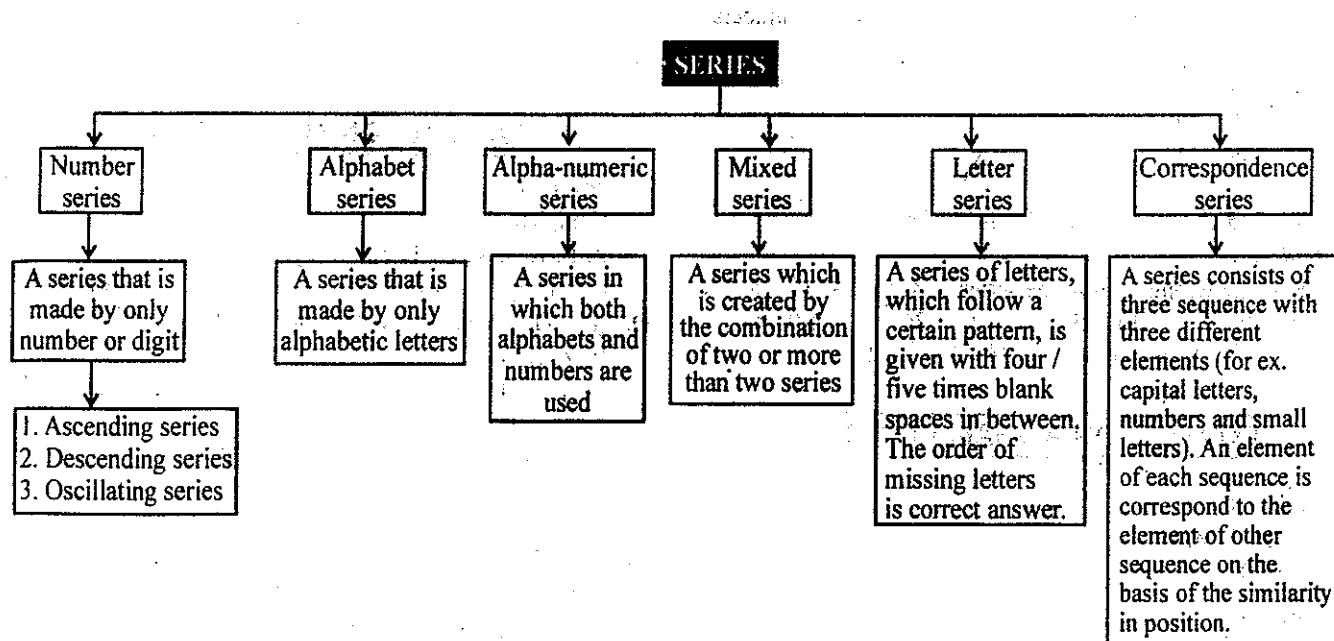
# 7

## CHAPTER

# SERIES

A series is a sequence of numbers/alphabetical letters or both which follow a particular rule. Each element of series is called 'term'. We have to analyse the pattern and find the missing term or next term to continue the pattern.

**Types of Series are explained in the following chart :**



In number series, relationship between the terms is of any kind.

For example,

- (1) Consecutive even numbers
- (2) Consecutive odd numbers
- (3) Consecutive Prime numbers
- (4) Square of numbers
- (5) Cubes of numbers
- (6) Square root of numbers
- (7) Omission of certain number of letter in any consecutive order
- (8) Addition /subtraction/ multiplication/ division by some number ( For Ex. A.P & G.P) or any other relation.

### TYPES OF QUESTIONS :

- (I) Complete the series
- (II) Find Missing number of the series
- (III) Find Wrong number of the series

### EXAMPLES ON NUMBER SERIES

#### (I) Complete the series

*Example 1 :*

$$4, 6, 9, 13, \dots$$

(a) 17      (b) 18      (c) 19      (d) 20

*Sol.* (b)  $\begin{array}{cccc} 4 & 6 & 9 & 13 \\ +2 & +3 & +4 & +5 \end{array}$  [18] Correct answer

$$+2 +3 +4 +5$$

*Example 2 :*

$$64, 32, 16, 8, ?$$

(a) 0      (b) 1      (c) 2      (d) 4

*Sol.* (d) Each number is half of its previous number.

*Example 3 :*

$$4, 9, 16, 25, \dots$$

(a) 32      (b) 42      (c) 55      (d) 36

*Sol.* (d) Each number is a whole square.

*Example 4 :*

$$2, 6, 12, 20, 30, 42, 56, \dots$$

(a) 60      (b) 64      (c) 70      (d) 72

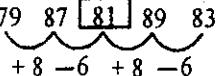
*Sol.* (d)  $1 \times 2, 2 \times 3, 3 \times 4, 4 \times 5, 5 \times 6, 6 \times 7, 7 \times 8, 8 \times 9 = 72$

## (II) To find the missing number of series :

**Example 5 :**

79, 87, ?, 89, 83

- (a) 80, (b) 81, (c) 82, (d) 88

Sol. (b) 

**Example 6 :**

37, 41, ?, 47, 53

- (a) 42, (b) 43, (c) 46, (d) 44

Sol. (b) Consecutive prime numbers.

**Example 7 :**

21, 34, ?, 89, 144

- (a) 43, (b) 55, (c) 64, (d) 71

Sol. (b) Each number is the sum of the two preceding numbers.

$$21 + 34 = 55$$

$$34 + 55 = 89$$

$$55 + 89 = 144$$

## (III) To find the wrong term in the series :

**Example 8 :**

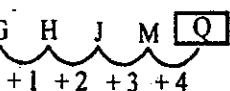
Find the wrong term in the series 3, 8, 15, 24, 34, 48, 63.

- (a) 15, (b) 15, (c) 34, (d) 63

Sol. (c)  $2^2 - 1, 3^2 - 1, 4^2 - 1, 5^2 - 1, 6^2 - 1$ **EXAMPLES ON ALPHABETIC SERIES****Example 9 :**

G, H, J, M, ?

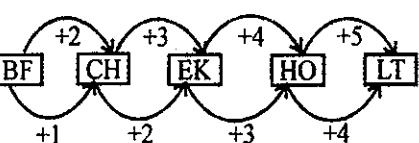
- (a) R, (b) S, (c) Q, (d) P

Sol. (c) 

**Example 10 :**

BF, CH, ?, HO, LT

- (a) FG, (b) EK, (c) CE, (d) FJ

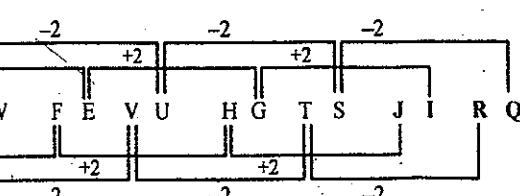
Sol. (b) 

**Example 11 :**

DCXW, FEVU, HGTS, ?

- (a) LKPO, (b) ABYZ, (c) JIRQ, (d) LMRS

Sol. (c) JIRQ

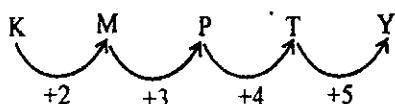


**EXAMPLES ON ALPHA-NUMERIC SERIES****Example 12 :**

K, I, M, 3, P, 5, T, 7, ?

- (a) Y9, (b) Y11, (c) V9, (d) V11

Sol. (b) Alphabets follow the sequence



And numbers are increasing by 2

**Example 13 :**

Find the missing term.

2 Z 5, 7 Y 7, 14 X 9, 23 W 11, 34 V 13, ?

Sol. First number is the sum of the number of the preceding term.

Middle letter is moving one step backward.

Third number in a term is a series of odd numbers.

 $\therefore 6^{\text{th}}$  term = 47 U 15.**EXAMPLES ON MIXED SERIES****Example 14 :**

Complete the series

Z, L, X, J, V, H, T, F, \_\_, \_\_

- (a) D, R, (b) R, D, (c) D, D, (d) R, R

Sol. (b) The given sequence consists of two series

(i) Z, X, V, T, \_\_

(ii) L, J, H, F, \_\_. Both consisting of alternate letters in the reverse order.

 $\therefore$  Next term of (i) series = R, and

Next term of (ii) series = D

**Example 15 :**

7, 5, 26, 17, 63, 37, 124, 65, ?, ?

- (a) 101, 215, (b) 101, 101, (c) 215, 101, (d) 215, 215

Sol. (c) The given series consists of two series

(i) 7, 26, 63, 124 ....

(ii) 5, 17, 37, 65 ....

In the first series,

$$7 = 2^3 - 1, 26 = 3^3 - 1, 63 = 4^3 - 1,$$

$$124 = 5^3 - 1, \therefore 6^3 - 1 = 215$$

and in the second series.

$$5 = 2^2 + 1, 17 = 4^2 + 1,$$

$$37 = 6^2 + 1, 65 = 8^2 + 1,$$

$$\therefore 10^2 + 1 = 101$$

**EXAMPLES ON LETTER SERIES****Example 16 :**

b a a b - a b a - b b a - -

- (a) bbbaa, (b) aaaa, (c) abab, (d) baba

Sol. (d) b a a b b a / b a a b b a / b a .

**Example 17 :**

-- a a b - a - a - b a

- (a) bbaab, (b) ababa, (c) bbabb, (d) aaaba

Sol. (b) a b a / a b a / a b a / a ba.

## EXAMPLES ON CORRESPONDENCE SERIES

**Example 18 :**

A	B	A	C	D	B	C	D	C
3	—	2	—	1	—	4	?	?
d	c	—	b	a	c	b	—	—

- (a) 1, 3, 4, 3      (b) 1, 4, 3, 4  
 (c) 2, 3, 4, 3      (d) 3, 4, 1, 4

Sol. (b) Clearly, 2 corresponds to A.

Now, b corresponds to C and 4 corresponds to b. So, 4 corresponds to C.

c corresponds to D and 3 corresponds to c. So, 3 corresponds to D.

So, the remaining number i.e., 1 corresponds to B.  
Thus, BCDC corresponds to 1, 4, 3, 4.

**Example 19 :**

C	B	—	D	—	B	A	B	C	C	B
—	—	1	2	4	3	—	—	?	?	?
a	—	a	b	—	c	—	b	—	—	—

- (a) 3, 4, 4, 3      (b) 3, 2, 2, 3  
 (c) 3, 1, 1, 3      (d) 1, 4, 4, 1

Sol. (c) Comparing the positions of the capital letters, numbers and small letters, we find :

a corresponds to C and 1 corresponds to a. So, a and 1 correspond to C.

b corresponds to A and 2 corresponds to b. So, b and 2 correspond to A.

Also, 4 corresponds to D.

So, the remaining number i.e. 3 corresponds to B. So, BCCB corresponds to 3, 1, 1, 3.

## EXERCISE

1. What is the next number in this sequence ?

1, 3, 8, 19, 42, 89, ?

- (a) 108      (b) 184      (c) 167      (d) 97

2. Which is the number that comes next in this sequence ?

5, 16, 51, 158, ....

- (a) 1452      (b) 483      (c) 481      (d) 1454

3. Which one of the numbers will complete the series ?

8, 13, 10, 15, 12, 17, 14, ...

- (a) 19      (b) 22      (c) 16      (d) 20

4. Find the next term of series :

DIL QTY BG ?

- (a) H      (b) I      (c) J      (d) P

5. 3, 15, 4, 16, 5, 17, 6, ?, ?

- (a) 12      (b) 18      (c) 15      (d) 13

6. Find the missing term in the following series.

240, ... 120, 40, 10, 2

- (a) 480      (b) 240      (c) 220      (d) 120

7. Find the missing term in the following series.

BCFG JK RS VW

- (a) LM      (b) OP      (c) QR      (d) NO

8. Which sequence of letters when placed at the blanks one after another will complete the given letter series ?

aa – bb – aa – abbb – a

- (a) bbba      (b) aabb      (c) baba      (d) abab

9. Complete the following series :

6.25, 9, 12.25, 16, 20.25, 25, 30.25, ?

- (a) 36      (b) 32      (c) 28.25      (d) 40.25

10. Choose the missing term out of the given alternatives :

J2Z, K4X, I7V, ?, H16R, M22P

- (a) I11T      (b) L11S      (c) L12T      (d) G11T

11. Find the missing term (?) in the following sequence :

\_ A D A C B \_ \_ B D C C

1 3 \_ \_ 1 2 4 2 \_ \_ \_

a \_ \_ b \_ \_ c d ? ? ?

- (a) a, c, d, d      (b) a, d, c, c  
 (c) c, a, d, d      (d) d, c, a, a

12. Find the next term of given series.

3F, 6G, 11I, 18L, ?

- (a) 21O      (b) 25N      (c) 27P      (d) 27Q

13. Find the next triplet of alphabets in the following series :

ABD, DGK, HMS, MTB, SBL, .... ?

- (a) ZKU      (b) ZKW      (c) XKW      (d) ZAB

14. Which sequence of letters when placed at the blanks one after another will complete the given letter series ?

ba \_ b \_ aab \_ a \_ b

- (a) abaa      (b) abba      (c) baab      (d) babb

15. Which sequence of letters when placed at the blanks one after another will complete the given letter series ?

c \_ bba \_ cab \_ ac \_ ab \_ ac

- (a) abcbc      (b) acbcb      (c) babcc      (d) bcacb

16. Which one number does not belong to the series ?

3, 5, 8, 11, 17, 23

- (a) 8      (b) 11      (c) 17      (d) 23

17. Which one number does not belong to the series ?

905, 180, 175, 35, 30, 6, 1

- (a) 6      (b) 1      (c) 175      (d) 905

18. Find the wrong term in the letter-number series given below :

G4T, J10R, M20P, P43N, S90L

- (a) G4T      (b) J10R      (c) M20P      (d) P43N

19. Which one of the numbers is wrong in the series given below?  
3, 2, 8, 9, 13, 22, 18, 32, 23, 42  
(a) 8      (b) 9      (c) 13      (d) 22
20. Which one of the numbers is wrong in the series given below?  
12, 18, 27, 90, 270, 945, 3780  
(a) 12      (b) 18      (c) 945      (d) 27
21. Which sequence of letters when placed at the blanks one after another will complete the given letter series?  
aab - cc - daa - bbb - ccccc  
(a) bdbd      (b) ddca      (c) dbbc      (d) bdac
22. What number will come next in the following series : 2, 2, 4, 4, 6, 8, 8.....  
(a) 10      (b) 12      (c) 14      (d) 16
23. Which number will fit in the following series 0, 7, 26, ?, 124, 215  
(a) 51      (b) 37      (c) 63      (d) 16
24. Complete the given series.  
2 12 36 80 150 ?  
(a) 194      (b) 210      (c) 252      (d) 258
25. Which numbers will come next in the following series? 1, 8, 9, 64, 25, 216, ?, ?  
(a) 49, 64      (b) 343, 64  
(c) 49, 512      (d) 343, 512
26. Which number will come next in the following set of numbers 3, 13, 53, 213 ?  
(a) 553      (b) 653      (c) 753      (d) 853
27. Find the wrong number in the series :  
7, 28, 63, 124, 215, 342, 511  
(a) 7      (b) 28      (c) 124      (d) 215
28. Which number will come next in the following set of numbers?  
2, 5, 7, 12, 15, 17, 22.....  
(a) 25      (b) 26      (c) 27      (d) 28
29. Which number will come next in the following set of numbers  
4, 16, 36, ?, 100, 144  
(a) 72      (b) 68      (c) 81      (d) 64
30. 1 CV, 5 FU, 9 IT, 15 LS, 17 OR  
(a) 9 JT      (b) 15 LS      (c) 5 FU      (d) 17 OR
31. B 0 R, G 3 U, E 3 P, J 7 S, H 9 N  
(a) E 3 P      (b) H 9 A      (c) J 7 S      (d) G 3 U
32. Which number will come next in the following series  
8, 15, 28, 53, ?  
(a) 98      (b) 106      (c) 100      (d) 102
33. Find the missing number in the series :  
6, 12, 21, ?, 48  
(a) 38      (b) 40      (c) 45      (d) 33
34. Find the missing letter in the series : C4X, F9U, I16R, ?  
(a) L25P      (b) L25O  
(c) L27P      (d) None of these
35. Which one number does not belong to the series ?  
11, 2, 21, 3, 32, 4, 41, 5, 51, 6  
(a) 21      (b) 11      (c) 32      (d) 51
36. Choose the missing term out of the given alternatives :  
cx fu ir ? ol ri  
(a) lo      (b) mn      (c) no      (d) op
37. Which sequence of letters when placed at the blanks one after another will complete the given letter series?  
abca \_ bcaab \_ ca \_ bbc \_ a  
(a) ccaa      (b) bbba      (c) abac      (d) abba
38. Which one of the numbers is wrong in the series given below?  
89, 78, 86, 80, 85, 82, 83  
(a) 83      (b) 82      (c) 86      (d) 78
39. Complete the given series.  
3, 12, 27, 48, 75, 108, ?  
(a) 147      (b) 162      (c) 183      (d) 192
40. What will be the next term in : BDF, CFI, DHL, ?  
(a) CJM      (b) EIM      (c) EJO      (d) EMI
41. Complete the given series.  
LXF, MTJ, NPN, OLR, ?  
(a) PHV      (b) PIU      (c) PJW      (d) PKX
42. Which one of the numbers is wrong in the series given below?  
5, 10, 17, 24, 37  
(a) 10      (b) 17      (c) 24      (d) 37
43. Which sequence of letters when placed at the blanks one after another will complete the given letter series?  
b \_ b \_ bb \_ bbb \_ bb \_ b  
(a) bbbbbba      (b) bbaabb  
(c) ababab      (d) aabaab

**DIRECTIONS (Qs. 44-45) :** What number will replace the question mark (?) in the questions below :

44. 1 2 3 2 10 12  
2 5 12 10 16 13  
1 2 1 ? 10 24  
(a) 5      (b) 11      (c) 13      (d) 8
45. 3 8 10 2 ? 1  
6 56 90 2 20 0  
(a) 0      (b) 3      (c) 5      (d) 7
46. When should the next term be ?  
336, 210, 120, ?, 24, 6, 0  
(a) 40      (b) 50      (c) 60      (d) 70
47. 2, 9, 28, ?, 126, 217  
(a) 36      (b) 42      (c) 56      (d) 65

**SERIES**

48. 3, 6, 24, 30, 63, 72, ?, 132  
 (a) 42      (b) 58      (c) 90      (d) 120
49. 2, 12, 36, 80, 150, ?  
 (a) 194      (b) 210      (c) 252      (d) 258
50. 1, 1, 2, 4, 7, 11, 16, ?  
 (a) 20      (b) 21      (c) 22      (d) 23
51. 24, 6, 18, 9, 36, 9, 24, ?  
 (a) 24      (b) 12      (c) 8      (d) 6
52. 1, 1, 2, 3, 5, 8, 13, ?  
 (a) 20      (b) 21      (c) 28      (d) 36
53. 7, 13, 27, 53, ?, 213  
 (a) 106      (b) 107      (c) 105      (d) 108
54. 24, 46, 68, ?  
 (a) 801      (b) 89      (c) 88      (d) 810
55. 6, 7, 15, 46, 185 ?  
 (a) 226      (b) 230      (c) 271      (d) 926
56. 5, 8, 14, 26, ?, 98  
 (a) 62      (b) 50      (c) 40      (d) 35
57. 1, 3, 6, 10, 15, ?, 28  
 (a) 20      (b) 21      (c) 22      (d) 24
58. 14, 12, 21, ?, 28, 24, 35, 30  
 (a) 16      (b) 18      (c) 20      (d) 22
59. 1, 8, 81, 16, ?, 1296  
 (a) 16      (b) 25      (c) 64      (d) 125
60. 8, 24, 16, ?, 7, 14, , 6, 18, 12, 5, 5, 10  
 (a) 14      (b) 10      (c) 7      (d) 5
61. 1, 1, 2, 6, 24, 120, ?  
 (a) 1440      (b) 720      (c) 480      (d) 240
62. 5, 9, 17, 33, 65, ?  
 (a) 100      (b) 111      (c) 129      (d) 145
63. 8, 1, 64, 27, ?, 125  
 (a) 216      (b) 196      (c) 169      (d) 81
64. 5, 12, 7, 15, 8, 18, 10, ?  
 (a) 28      (b) 21      (c) 11      (d) 10
65. 78, 79, 81, ?, 92, 103, 119  
 (a) 88      (b) 85      (c) 84      (d) 83
66. 3, 4, 5, 5, 12, 13, 7, 24, 25, 9, ?  
 (a) 16      (b) 24      (c) 35      (d) 40
67. 0, 1, 3, 7, 15, ?, 63  
 (a) 18      (b) 21      (c) 31      (d) 41
68. 1, 4, 27, 256, ?  
 (a) 5      (b) 25      (c) 3125      (d) 625
69. Z T P K H F.

Which alphabet is wrongly place in the series.

- (a) Z      (b) P      (c) T      (d) F

**DIRECTIONS (Qs. 70-72) :** In each of the following number series, two terms have been put within brackets. Mark your answers as:

- (a) If both the bracketed terms are right.
  - (b) If the first bracketed term is right and the second is wrong.
  - (c) If the first bracketed term is wrong and the second is right.
  - (d) If both the bracketed terms are wrong.
70. (2), 5, (12), 25, 42, 61
71. 3, 10, 29, (66), (127), 218
72. 4, 6, 10, (12), 16, (14), 22

**DIRECTIONS (Qs. 73-77) :** In each of these questions, various terms of a series are given with one term missing as shown by (?). Choose the missing term :

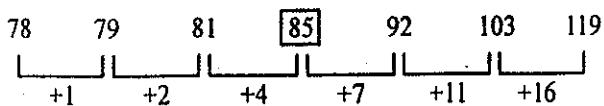
73. QPO, SRQ, UTS, WVU, (?)  
 (a) XVZ      (b) YXW      (c) ZYA      (d) VWX
74. 19, 2, 38, 3, 114, 2, (?)  
 (a) 228      (b) 352      (c) 256      (d) 456
75. YEB, WFD, UHG, SKI, (?)  
 (a) QOL      (b) TOL      (c) QGL      (d) QNL
76. AZ, CX, FU, (?)  
 (a) IR      (b) JQ      (c) IV      (d) KP
77. 2Z5, 7Y7, 14X9, 23W11, 34V13, (?)  
 (a) 27U24      (b) 45U15      (c) 47U15      (d) 27V14
78. If the following series is written in the reverse order, which number will be fourth to the right of the seventh number from the left ?  
 7, 3, 9, 7, 03, 8, 4, 6, 2, 1, 0, 5, 11, 13  
 (a) 0      (b) 5      (c) 9      (d) 11
79. Thirty six vehicles are parked in a parking lot in a single row. After the first car, there is one scooter. After the second car, there are two scooters. After the third car, there are three scooters and so on. Work out the number of scooters in the second half of the row.  
 (a) 10      (b) 12      (c) 15      (d) 17
80. In a school, the following codes were used during physical exercise. 1 means start walking, 2 means keep standing, 3 means start running at the same spot, 4 means sit down. How many times a student, who performs the following sequence without error from the begining to the end, has to sit down ?  
 1 2 3 4 2 3 1 4 4 3 2 2 1 2 4 3 1 4 4 1 2  
 (a) 2      (b) 3      (c) 6      (d) 5
81. In the following sequence or instructions, 1 stands for *Run*, 2 stands for *Stop*, 3 stands for *Go*, 4 stands for *Sit* and 5 stands for *Wait*. If the sequence is continued, which instruction will come next ?  
 4 4 5 4 5 3 4 5 3 1 4 5 3 1 2 4 5 4 5 3 4 5 3  
 (a) Wait      (b) Sit      (c) Stop      (d) Run

# SOLUTIONS

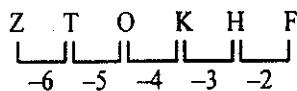
1. (b) Each of the numbers is doubled and 1, 2, 3, 4, 5, 6 is added in next term, so  $89 \times 2 + 6 = 184$ .
2. (c)  $16 = 5 \times 3 + 1$ ,  $51 = 16 \times 3 + 3$ ,  
 $158 = 51 \times 3 + 5$   
 $\therefore$  Next term  $= 158 \times 3 + 7 = 481$
3. (a) Second term is greater than first term by 5, while the third term is less than the second term by 3. The same order is repeated.
4. (c) After D, 4 letters are skipped and I follows after which 2 letters are skipped. Trend flows alternatively :  
D(EFGH) I(JK) L(MNOP) Q(RS) T(UVWX) Y(ZA)  
B(CDEF) G(HI) J
5. (b) There are two alternate series.  
1st series : 3, 4, 5, 6, 7 ..... and so on.  
2nd series : 15, 16, 17, 18, 19 ..... and so on.
6. (b) Ratios of two consecutive terms are 1, 1/2, 1/3, 1/4, and 1/5 respectively.
7. (d)  $BC \xrightarrow{+3} FG \xrightarrow{+3} JK \xrightarrow{+3} \boxed{NO} \xrightarrow{+3} RS$
8. (a)  $a\ a\ \underline{b}\ b / b\ \underline{b}\ a\ a / a\ a\ b\ b / b\ b\ \underline{a}\ a$ .
9. (a) There are two alternate series  
Series I - 6.25, 12.25, 20.25, 30.25 (sequence is +6, +8, +10)  
Series II - 9, 16, 25, 36, (sequence is +7, +9, +11)
- |      |    |       |    |       |    |       |    |
|------|----|-------|----|-------|----|-------|----|
| +6   | +8 | +10   |    |       |    |       |    |
| 6.25 | 9  | 12.25 | 16 | 20.25 | 25 | 30.25 | 36 |
| +7   | +9 | +11   |    |       |    |       |    |
10. (d) The first letters in odd numbered terms form series J, I, H and in even numbered terms form the series K, L, M. The sequence followed by the numbers is +2, +3, +4, +5, +6. The third letter of each term is moved two steps backward to obtain the third letter of the next term.
11. (d) Clearly, b corresponds to A.  
1 corresponds to C and a corresponds to 1. So, a corresponds to C.  
2 corresponds to B and d corresponds to 2. so, d corresponds to B.  
So, the remaining letter i.e., c corresponds to D. Thus, BDCC corresponds to d, c, a, a.
12. (c) The letters in the first, second, third and fourth terms are respectively moved one, two, three and four steps forward to obtain the letter in the subsequent terms. The sequence followed by the numbers is +3, +5, +7, +9.
13. (b) The first letters of the triplets move 3, 4, 5, 6, 7 .... steps forward.  
The second letters of the triplets move 5, 6, 7, 8, 9 .... steps forward.  
The third letters of the triplets move 7, 8, 9, 10 .... steps forward.  
Hence, the next triplet of alphabets is ZKW.
14. (b)  $ba\cancel{a}/\cancel{b}aab/\cancel{b}aab$
15. (b)  $cabb\cancel{a}/\cancel{c}abbac/\cancel{c}abbac$ .
16. (b) Differences between two consecutive terms are 2, 3, 4, 5 and 6 respectively.
17. (d) The sequence followed in the series is  $\div 5, -5$  which is repeated.
- |          |     |          |    |          |    |   |
|----------|-----|----------|----|----------|----|---|
| 900      | 180 | 175      | 35 | 30       | 6  | 1 |
| $\div 5$ | -5  | $\div 5$ | -5 | $\div 5$ | -5 |   |
- $\therefore$  900 should be in place of 905.
18. (b) The first letter of each term is moved three steps forward and the last letter is moved two steps backward to obtain the corresponding letters of the next term. The numbers follow the sequence  $\times 2 + 1, \times 2 + 2, \times 2 + 3, \times 2 + 4$ . So, 10 is wrong and must be replaced by  $(4 \times 2 + 1)$  i.e. 9.
19. (b) There are 2 series :  
3, 8, 13, 18, 23 and 2, 12, 22, 32, 42. Hence 9 is wrong.
20. (d) If 27 is replaced by 36, then the ratios of two consecutive terms are  $3/2, 2, 5/2, 3, \dots$
21. (d)  $a\ a\ b\ \underline{b}\ c\ c\ \underline{d}\ d / a\ a\ \underline{a}\ b\ b\ b\ \underline{c}\ c\ c\ \underline{d}\ d\ d$
22. (d) The given series consists of 2 series  
(i) 2, 4, 6, 8 ..... (ii) 2, 4, 8 .....  
Series (i)  $\rightarrow 2 \times 1, 2 \times 2, 2 \times 3, 2 \times 4 \dots$   
Series (ii)  $\rightarrow 2, 2 \times 2, 4 \times 2, 8 \times 2 = 16 \dots$
23. (c) Clearly the given series is  $1^3 - 1, 2^3 - 1, 3^3 - 1, 4^3 - 1, 5^3 - 1, 6^3 - 1$ .  
So, the missing number is  $4^3 - 1 = 64$ .
24. (c)  $1^3 + 1^2 = 2, 2^3 + 2^2 = 12, 3^3 + 3^2 = 36$  and so on  $\therefore 6^3 + 6^2 = 252$
25. (c) The odd terms are squares of the numbers 1, 3, 5, .... while the even terms are cubes of the numbers 2, 4, 6, ....
26. (d) The difference in consecutive nos. follows the sequence, 10, 40, 160.  
So the next difference  $= 160 \times 4 = 640$   
Therefore number  $= 213 + 640 = 853$ .
27. (b) The series is  
 $2^3 - 1, 3^3 - 1, 4^3 - 1, 5^3 - 1, 6^3 - 1, 7^3 - 1, 8^3 - 1$

28. (a)  $2+3=5, 5+2=7, 7+5=12, 12+3=15, 15+2=17, 17+5=22$ . Note that 3,2,5 are being added that order to various numbers to get the next number. Therefore, 3 should be added to 22 to get the answer.
29. (d) The numbers in the series are square of 2,4,6 ... ,10,12 . Therefore, the missing number is square of 8 i.e.  $8^2=64$ .
30. (b) The numerical parts moves with a difference of + 4. Thus, the correct sequence of the numerical components would be 1, 5, 9, 13, 17 Therefore, 15 LS does not fit in the series.
31. (c) There are two series :  
 I. B0R E3P H9N  
 First letter moves + 3 steps forward. The middle numerical component moves + 3, + 6, + 9 ..... and the letter in the third position moves 2 steps backwards (-2).  
 II. G3U,J7S  
 The same pattern follows in this series.  
 Hence, J7S does not fit.
32. (d)  $8 \times 2 - 1 = 15, 15 \times 2 - 2 = 28, 28 \times 2 - 3 = 53,$   
 $53 \times 2 - 4 = 102$
33. (d) The common differences between the consecutive terms of the series are 6, 9, 12, 15, etc.
34. (b) C is the 3rd letter, F sixth, I ninth so next letter will be 12th, i.e. L.  
 The middle numerics are the squares of 2, 3, 4 and so on. So next numeric would be 25.  
 The last letter follow the order : U is 3rd letter after R, X is 3rd after U. So, R would be 3rd letter after 'O'.  
 $\therefore$  Missing term = L25O.
35. (c) The given sequence is a combination of two series :  
 I. 11, 21, 32, 41, 51 and II. 2, 3, 4, 5, 6  
 Clearly, the pattern in I is +10  
 So, 32 is wrong and should be replaced by  $(21 + 10)$  i.e. 31.
36. (a) The first letter of each term is moved three steps forward and the second letter is moved three steps backward to obtain the corresponding letters of the next term.
37. (c) The series is abc/aabc/aabb/aabbcc/a.
38. (c) The sequence is -11, +9, -7, +5, -3, +1  
 So, 86 is wrong and should be replaced by  $(78 + 9)$  i.e. 87.
39. (a) The numbers are  $3 \times 1^2, 3 \times 2^2, 3 \times 3^2, 3 \times 4^2, 3 \times 5^2, 3 \times 6^2, \dots$   
 $\therefore$  Missing number =  $3 \times 7^2 = 3 \times 49 = 147$
40. (c) Clearly, the first, second and third letters of each term are respectively moved one, two and three steps forward to obtain the corresponding letters of the next term. So, the next term is EJO.
41. (a) The first letter of each term is moved one step forward, the second letter is moved four steps backward and the third letter is moved four steps forward to obtain the corresponding letters of the next term.
42. (c) The sequence is +5, +7, .....  
 So, 24 is wrong and should be replaced by  $(17+9)$  i.e. 26.
43. (c) The series is babb/bbab/bbba/bbbb.  
 Thus, in each sequence, 'a' moves one step forward and 'b' takes its place and finally in the fourth sequence, it is eliminated.
44. (c)
- |   |   |    |    |    |    |
|---|---|----|----|----|----|
| 1 | 2 | 3  | 2  | 10 | 12 |
| 2 | 5 | 12 | 10 | 16 | 13 |
| 1 | 2 | 1  | ?  | 10 | 24 |
| 4 | 9 | 16 | 25 | 36 | 49 |
- $+5$      $+7$      $+9$      $+11$      $+13$
- Hence, the missing term is  $25 - (2 + 10) = 13$ .
45. (c) The upper number in each column divides the lower number completely. Hence the correct option is (c) as only 5 divides 20 completely.
46. (c) Note that  $0 = 1^3 - 1$   
 $6 = 2^3 - 2$   
 $24 = 3^3 - 3$
47. (d) The terms exhibit the pattern  $n^3 + 1$ , n taking values 1, 2, 3.....
48. (d) Terms taken alternately form two sequences.  
 These are  
 $3, 24, 63 ?$        $6, 30, 72, 132$   
 $3 = 2^2 - 1$        $6 = 2^2 + 2$   
 $24 = 5^2 - 1$        $30 = 5^2 + 5$   
 $63 = 8^2 - 1$        $72 = 8^2 + 8$   
 Next term =  $11^2 - 1 = 120$
49. (c)  $2 = 1^2 + 1^3$   
 $12 = 2^2 + 2^3$   
 $36 = 3^2 + 3^3$  and so on.
50. (c)
- |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| 1  | 1  | 2  | 4  | 7  | 71 | 16 | 22 |
| +0 | +1 | +2 | +3 | +4 | +5 | +6 |    |
51. (b) Consider pairs of numbers:  
 24 : 6, 6 is one-fourth of 24 :  
 18, 9, 9 is half of 18;  
 36, 9 : 9 is one fourth of 36
52. (b) Each term is the sum of two preceding terms.
53. (b)  $\times 2 \pm 1$ . Thus  $53 \times 2 + 1 = 107$
54. (d) Consecutive even number. Next term is 810.
55. (d) Preceding term is multiplied by 1, 2, 3, 4, 5 respectively and then 1 is added to the product
56. (b) Each difference is twice the previous difference.
57. (b) Numbers, differences increase by 1.

58. (b) Two sequences of numbers are alternatively arranged.
59. (d) Numbers are in sets of three such that  $1^2 = 1$ ,  $2^3 = 8$ ,  $3^4 = 81$  and so on
60. (c) Numbers are in sets of three: first set has middle term as the sum of the terms on its left and right; the second set has middle term as the difference and so on
61. (b) Preceding term is multiplied by 1, 2, 3, 4, 5 respectively to get the next term.
62. (c) Each number is 1 less than twice the preceding number.
63. (a) Alternate terms are cubes of even and odd numbers respectively.
64. (b) Second, fourth, sixth numbers are the sum of number on their left and right.
65. (b) Differences of the first set of differences are increasing by 1 viz.

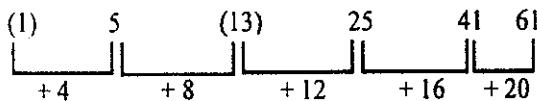


66. (d) Number are in sets of three such that each set forms a Pythagorean triple, i.e.,  $3^2 + 4^2 = 5^2$ ,  $5^2 + 12^2 = 13^2$ ,  $7^2 + 24^2 = 25^2$  and so on.
67. (c) Differences are  $2^0$ ,  $2^1$ ,  $2^2$ ,  $2^3$ , and so on.
68. (c) The terms are  $1^1$ ,  $2^2$ ,  $3^3$ ,  $4^4$  and so on.
69. (b) The difference between the letters is decreased by one at each step.

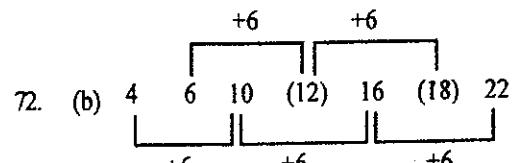


O should be in place of P.

70. (d) The correct series will be



71. (a)  $3 \quad 10 \quad 29 \quad (66) \quad (127) \quad 218$
- $$\overline{1^3+2} \quad \overline{2^3+2} \quad \overline{3^3+2} \quad \overline{4^3+2} \quad \overline{5^3+2} \quad \overline{6^3+2}$$



72. (b) Each letter moves +2 steps.
74. (a)  $19 \times 2 = 38$ ,  $38 \times 3 = 114$ ,  $114 \times 2 = 228$ .
75. (a) 1st letter moves -2 steps each time.  
2nd letter moves +1, +2, +3, +4 steps respectively.  
3rd letter moves +2, +3, +4 steps respectively.
76. (b) 1st letter moves +2, +3 and +4 steps respectively.  
2nd letter moves -2, -3 and -4 steps respectively.
77. (c) 1st number moves +5, +7, +9, +11, +13 steps respectively.  
3rd number moves +2 steps each time.  
2nd letter moves -1 step each time.
78. (a) The given series when written in the reverse order becomes.  
 $13, 11, 5, 0, 1, 2, 6, 4, 8, 3, 0, 7, 9, 3, 7$   
The 7<sup>th</sup> number from the left is 6. The 4<sup>th</sup> number to the right of 6 is 0.
79. (c) Let C and S denote car and scooter respectively. Then, the sequence of parking is  
C S C S S C S S S C S S S S C S S S /  
S S C S S S S S C S S S S S S C  
The above sequence has been divided into two equal halves by a line. Clearly, number of scooters in second half of the line = 15.
80. (c) Code for sit down = 4.  
In the given sequence; 4 is repeated six times. Hence, the student has to sit down six times.
81. (d) 4, 45, 453, 4531, 45312, 45, 453, 4531  
The next coded digit will be 1. Hence, the instruction Run will come next.

○ ○ ○

# CHAPTER

# 8

# INPUT - OUTPUT

## INTRODUCTION

In this type of questions, a sequence, either in form of a sentence or in numeric form is given. This sequence is popularly known as input. The input is followed by steps of rearrangement to give sequential output. The candidate is required to understand the pattern in the given arrangement and then determine the desired output step, according as asked in the questions.

Generally the machine produces output on the given input using one of the following four operations.

### TYPE 1. SHIFTING

In this type of problems, elements of the given input are shifted (that is, their positions are changed) as per some logic.

### SOLVING PROBLEMS :

The most common and easy way of solving the shifting based problems is preparing a reference chart. In this method, we replace the words of the given input by digits 0,1,2 ... Then step I, step II step III... are drawn by observing the movements of shifts of the various steps.

You should draw a reference chart for as many steps as required using the digits. After that you should read the question and solve them accordingly.

**DIRECTIONS (for Examples 1 to 5): Study the following information carefully and answer the questions given below:**

An export processing unit has a computerized machine, which generates six codes to distinguish product of each of seven batches produced in a day. The machine is fed code for first batch of each day. Based on that, the machine generates 6 codes by rearrangements of words for subsequent batches. Following is an illustration of generation of codes for same batches of a day.

**Batch I : who nut cream page for table.**

**Batch II : who for cream page nut table.**

**Batch III : who for page cream nut table.**

**Batch IV : table for page cream nut who.**

**Batch V : page table for nut who cream.**

**Batch VI : page who for nut table cream.**

and so on till seventh batch. Next day based on the same rule, new set of words will be introduced as given above.

1. If the seventh batch of the day is 'from door no leaf glass but', which of the following would be the first three words of code of batch III of that day ?
  - (a) door leaf from
  - (b) door leaf but
  - (c) glass leaf from
  - (d) but door no
2. If the code of sixth batch of the day is 'very say could man on fire', which of the following batch code would read as 'say could very fire man on'?
  - (a) Second
  - (b) Third
  - (c) Fourth
  - (d) Fifth
3. If the code of fourth batch is 'so when clean get lemon dust', which of the following would be the code for seventh batch?
  - (a) get dust lemon when so clean.
  - (b) clean so when lemon dust get.
  - (c) when get dust so clean lemon
  - (d) clean dust lemon when so get
4. If the first batch code of a day is 'five gave it close to mine', which of the following will be the code for fourth batch?
  - (a) five to it close gave mine.
  - (b) mine to close it gave five.
  - (c) five to close it gave mine.
  - (d) close five to gave mine it
5. If the code of fifth batch of a day is 'same is tea at now then', which of the following would definitely be the first batch of that day?
  - (a) tea same is now then at.
  - (b) same now tea at is then.
  - (c) now at then same tea is .
  - (d) now tea is same then at .

**Solutions :**

- 1-5. Rule used for arrangements in the illustration suggests that words have been arranged in the following ways:

	Who	nut	cream	page	for	table
Batch I	1	2	3	4	5	6
Batch II	1	5	3	4	2	6
Batch III	1	5	4	3	2	6
Batch IV	6	5	4	3	2	1
Batch V	5	4	6	1	3	2
Batch VI	2	4	6	1	3	5

In the above arrangement, in second batch, second and fifth words are exchanged, in third batch, third and fourth words are exchanged, in fourth batch, first and sixth words are exchanged. The fifth batch shows the last arrangement having all the numeric in descending order because subsequently sixth batch becomes identical to second batch and so on.

1. (a) Following the above rule, if we continue the above arrangement further we get VIIth batch identical to 3rd batch on exchanging 5th numbered word with 6th numbered word — 4 1 2 5 6 3. Hence, seventh batch arrangement words occupy opposition in the same order i.e. from door no leaf glass but. Therefore, third batch order would be

4.	1	2	5	6	3
or	door	leaf	from	.....	
	1	5	4		

2. (b) Using the above arrangement procedure sixth batch of the words arrangement occupies order — very say could man on fire.

Therefore, the batch — “say could very fire man on” has order 154326. And it is clear that it is the 3rd batch arrangement.

3. (d) Fourth batch : ‘so when clean get lemon dust’

6	5	4	3	2	1
---	---	---	---	---	---

Hence, seventh batch : 4 1 2 5 6 3 which is identical to “clean dust lemon when so get”

4. (b) First batch: five gave it close to mine

1	2	3	4	5	6
---	---	---	---	---	---

Fourth batch: mine to close it gave five

6	5	4	3	2	1
---	---	---	---	---	---

5. (c) Fifth batch: Same is tea at now then

4	6	5	2	1	3
---	---	---	---	---	---

First batch: Now at then same tea is

1	2	3	4	5	6
---	---	---	---	---	---

Step IV is the last step of the rearrangement of the above input.

As per the rule followed in the above steps, answer the following questions.

6. Input : 98 11 64 22 but will an it  
which of the following will be step VI?

(a) step VI can't be possible because step V will be the last step

(b) an 98 but 64 it 22 11 will

(c) an 98 but 64 it 22 will 11

(d) an 11 but 22 it 64 will 98

7. Input: 32 now 20 gift 53 box 62 at  
Which of the following will be step IV?

(a) at 62 box 53 32 now 20 gift

(b) at 62 box 53 gift 32 now 20

(c) at 62 box 53 gift 20 now 32

(d) at 62 53 box 32 now 20 gift

8. Input: pay by 18 36 nose ear 72 54  
Which of the following steps will be the last step?

(a) Can't say (b) Five

(c) Seven (d) Six

9. Step III of an input is:

damn 96 flag 87 78 14 saint put

which of the following steps will be the last but one?

(a) Can't say (b) Four

(c) Five (d) Six

10. Step II of an input is :

jug 99 wax sun top 15 31 47

which of the following is definitely the input?

(a) wax sun top 15 31 47 jug 99

(b) wax sun jug 99 top 15 31 47

(c) wax sun top jug 99 15 31 47

(d) Cannot be determined

11. Step IV of an input is: Come 95 forward 40 sky 17 over 23.  
Then which of the following can certainly not be step III?

(a) come 95 forward sky 17 over 23 40

(b) come 95 forward 17 sky over 23 40

(c) come 95 forward sky 40 17 over 23

(d) Cannot be determined

#### Solutions :

- 6-11. Here, logic is very simple. It is a case of Arrangement. Input and following steps give the following information:  
In step I the word which comes first according to alphabetical order rearranges first.  
In the second step the highest among the given numbers gets arranged and occupies the place after the word arranged in step I.

These two steps get repeated alternately. Thus, in the last step all the words get arranged alphabetically whereas numbers get arranged in descending order.

If any word or number is already arranged in any step, the next number or word is arranged.

6. (c) Input : 98 11 64 22 but will an it

Step I : an 98 11 64 22 but will it

Step II : an 98 but 11 64 22 will it

Step III : an 98 but 64 11 22 will it

Step IV : an 98 but 64 it 11 22 will

#### TYPE 2 : ARRANGING

Here the inputs are arranged as per a particular order. For example, number can be arranged as per increasing or decreasing order while word can be arranged as per the order in which they appear in dictionary.

#### SOLVING PROBLEMS :

There is no general strategy for solving these questions. However, you should always begin by analysing the following

- (a) Is the arrangement being done in an ascending order descending order (for numbers) and arrangement being done in according to dictionary?
- (b) Is the arrangement being done only from left side or right side or is it being done from left and right alternately?

#### DIRECTIONS (for Example 6 to 11) : Study the following information carefully and answer the given questions :

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement:

Input : exam 81 56 over down up 16 64

Step I : down exam 81 56 over up 16 64

Step II : down 81 exam 56 over up 16 64

Step III : down 81 exam 64 56 over up 16

Step IV : down 81 exam 64 over 56 up 16

- Step V : an 98 but 64 it 22 11 will  
 Step VI : an 98 but 64 it 22 will 11
7. (a) Input : 32 now 20 gift 53 box 62 at  
 Step I : at 32 now 20 gift 53 box 62  
 Step II : at 62 32 now 20 gift 53 box  
 Step III : at 62 box 32 now 20 gift 53  
 Step IV : at 62 box 53 32 now 20 gift
8. (d) Input : pay by 18 36 nose ear 72 54  
 Step I : by pay 18 36 nose ear 72 54  
 Step II : by 72 pay 18 36 nose ear 54  
 Step III : by 72 ear pay 18 36 nose 54  
 Step IV : by 72 ear 54 pay 18 36 nose  
 Step V : by 72 ear 54 nose pay 18 36  
 Step VI : by 72 ear 54 nose 36 pay 18
9. (b) Step III : damn 96 flag 87 78 14 saint put  
 Step IV : damn 96 flag 87 put 78 14 saint  
 Step V : damn 96 flag 87put 78 saint 14  
 Step V is the last step. Therefore, penultimate step is step IV.
10. (d) Previous steps cannot be determined .  
 11. (b) '17' cannot be before 'sky'

### TYPE 3 : ARITHMETICAL OPERATION

As the name suggests, here the input consists of certain numbers. The subsequent steps are obtained by taking the number of the input and performing some arithmetical operations on them. For example

**DIRECTIONS (for Example 12 to 16) :** Study the following information and answer the given question.

A number arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

Input : 44	38	24	55	16	14	85
Step I : 8	2	6	1	7	5	4
Step II : 60	0	32	-3	45	21	12
Step III: 6	0	5	-3	9	3	3
Step IV : 7	4	14	13	34	39	52
Step V : 15	12	22	21	42	47	60
Step VI : 6	3	4	3	6	2	6

12. What will be the 4th step of the following input?  
 Input : 23, 61, 15, 35, 54, 75, 85  
 (a) 4, 13, 14, 22, 30, 41, 52,  
 (b) 4, 12, 14, 20, 30, 41, 52  
 (c) 3, 13, 14, 20, 30, 41, 52  
 (d) 4, 13, 15, 22, 32, 41, 52
13. The second step of a given input is 45, 60, 21, 77, 0, -3, 32. What will be step V for the input?  
 (a) 10, 18, 20, 28, 33, 41, 52  
 (b) 18, 10, 20, 28, 33, 41, 52  
 (c) 18, 18, 20, 29, 33, 41, 62  
 (d) 18, 18, 29, 20, 33, 41, 52

14. In how many steps would the following arrangement be yielded by the given input?  
 Input: 43, 37, 42, 64, 25, 23, 76  
 Arrangement: 10, 1, 14, 13, 34, 39, 52  
 (a) IV (b) V  
 (c) III (d) II
15. What would be the 5th step of the input?  
 Input: 35, 56, 33, 46, 16, 32, 94  
 (a) 12, 15, 21, 22, 42, 47, 60  
 (b) 15, 12, 22, 21, 42, 47, 60  
 (c) 7, 4, 14, 13, 34, 39, 52  
 (d) 6, 3, 4, 6, 3, 2, 6
16. What will be the input for the following 5th step?  
 Step V: 14, 11, 23, 27, 34, 56, 62  
 (a) 57, 42, 68, 17, 14, 81, 29  
 (b) 52, 41, 17, 81, 14, 68, 29  
 (c) 51, 42, 71, 17, 15, 23, 61  
 (d) Can't be determined  
 (e) None of these

**Solutions :**

Step I : is the digit-sum of the numbers in the input.  
 Step II : is obtained by squaring the numbers in step I and then subtracting '4' (some numbers could be negative.)

Step III : is the digit-sum of the numbers in step 2.  
 Step IV : the squares of natural number is added to the number in, step III [i.e. + 1<sup>2</sup>, + 2<sup>2</sup>, + 3<sup>2</sup> ...]  
 Step V : We add 8 to the nos. in step IV.

Step VI : is the digit sum of numbers in step 5.

12. (a) Input: 23 61 15 35 54 75 85  
 Step I: 5 7 6 8 9 3 4  
 Step II: 21 45 32 60 77 5 12  
 Step III: 3 9 5 6 5 5 3  
 Step IV: 4 13 14 22 30 41 52
13. (c) Step II : 45 60 21 77 0 -3 32  
 Step III : 9 6 3 5 0 -3 5  
 Step IV : 10 10 12 21 25 33 54  
 Step V : 18 18 20 29 33 41 62
14. (a) Input: 43 37 42 64 25 23 76  
 Step I: 7 1 6 1 7 5 4  
 Step II: 45 -3 32 -3 45 21 12  
 Step III: 9 -3 5 -3 9 3 3  
 Step IV: 10 1 14 13 34 39 52
15. (b) Input: 35 56 33 46 16 32 94  
 Step I: 8 2 6 1 7 5 4

As step I is same as given in example. Hence, step V will be same.

16. (d) As step I and III are determined by digit- sum, previous, step can't be determined.

### TYPE 4 : MISCELLANEOUS

As the name suggests any type of input output logic that is not covered under any of the categories listed above, would fall under this category.

There is no great trick in tackling these problems. But you will have to understand the logic. Once you have understood the logic on which the sequence progress, it is easy to answer questions.

**DIRECTIONS (for Example 17 to 21) :** Study the following information to answer the given questions.

A word arrangement machine when given an input line of words, rearranges them following a particular rule in each step. The following is an illustration of the input and the steps of rearrangement.

**Input :** wearing dress tops strappy you avoid arm

**Step I :** strappy wearing dress tops you avoid arm

**Step II :** strappy wearing avoid dress tops you arm

**Step III :** strappy wearing avoid dress tops arm you

(Step III is the last step for this input)

As per the rules followed in the above steps, find out in the given questions the appropriate step for the given input.

17. **Input:** threats gang careful answer agree classes more. Which of the following will be the third step for this input?

(a) careful threats gang answer agree classes more

(b) careful classes threats answer gang agree more

(c) careful answer classes agree threats gang more

(d) careful classes threats gang answer agree more

18. If the second step of an input is 'children teachers bunking school canteen movie freedom' which of the following will be its fifth step?

(a) children teachers bunking canteen school movie freedom

(b) bunking teachers children school canteen movie freedom

(c) canteen freedom school movie children teachers bunking

(d) It cannot have fifth step

19. If the input is 'pangs of worst and fears the neglect', which of the following will be the step IV?

(a) neglect fears pangs worst and of the

(b) and the neglect of pangs worst fears

(c) and the of neglect pangs worst fears

(d) worst pangs fears neglect of and the

20. **Input:** 'her famous away sibling thing usual stay'.

Which of the following steps would be the last step for this input?

(a) III      (b) IV      (c) V      (d) VI

21. If step V of an input is 'holding bench elbow floor bent lie your on', what will be step II?
- on lie holding bench floor bent elbow your
  - holding bench elbow lie your floor on bent
  - holding bench elbow floor lie your on bent
  - we can't move backward.

**Solutions :**

17-21. The words are arranged according to the number of letters they have, one at a time. The word with the maximum number of letters is put first. If two words have the same number of letters, we go for alphabetical arrangement.

17. (b) **Input :** threats gang careful answer agree classes more

**Step I :** careful threats gang answer agree classesmore

**Step II :** careful classes threats gang answer agree more

**Step III :** careful classes threats answer gang agree more

18. (d) **Step II :** Children teachers bunking school canteen movie freedom

**Step III :** children teachers bunking canteen school movie freedom

**Step IV :** children teachers bunking canteen freedom school movie.

Now, step IV would be the last step.

19. (a) **Input :** pangs of worst and fears the neglect

**Step I :** neglect pangs of worst and fears the

**Step II :** neglect fears pangs of worst and the

**Step III :** neglect fears pangs worst of and the

**Step IV :** neglect fears pangs worst and of the

20. (d) **Input :** her famous away sibling thing usual stay

**Step I :** sibling her famous away thing usual stay

**Step II :** sibling famous her away thing usual stay

**Step III :** sibling famous thing her away usual stay

**Step IV :** sibling famous thing usual her away stay

**Step V :** sibling famous thing usual away her stay

**Step VI :** sibling famous thing usual away stay her

21. (d) We can't move backward

## EXERCISE

**DIRECTIONS (Qs. 1 to 4) :** Answer the questions based on the following information.

A number arrangement machine, when given a particular input, rearranges it following a particular rule. Illustration of the input and the steps of arrangement is given below.

**Input :** 245, 316, 436, 519, 868, 710, 689

**Step I :** 710, 316, 245, 519, 868, 436, 689

**Step II :** 710, 316, 245, 436, 868, 436, 689

**Step III :** 710, 316, 245, 436, 519, 868, 689

**Step IV :** is the last step for the given input

1. If the input is given as "655, 436, 764, 799, 977, 572, 333", which of the following step will be " 333, 436, 572, 655, 977, 764, 799"?

(a) Step III      (b) Step II

(c) Step IV      (d) None of the above

2. How many step will be required to get the final output from the following input?  
**Input :** 544, 653, 325, 688, 461, 231, 857  
 (a) 6                   (b) 5  
 (c) 4                   (d) None of the above
3. Step III for an input is "432, 433, 542, 666, 734, 355, 574". What will be the first step for the input??  
 (a) 666, 542, 734, 433, 574, 355  
 (b) 542, 666, 734, 433, 574, 355.  
 (c) 355, 574, 433, 432, 734, 666, 542  
 (d) Cannot be determined
4. What will be the third step for the following input?  
**Input:** 653., 963, 754, 345, 364, 861, 541  
 (a) 541, 345, 754, 963, 364, 816, 653  
 (b) 541, 345, 364, 653, 963, 754, 861.  
 (c) 541, 345, 364, 653, 963, 754, 861.  
 (d) 541, 345, 364, 653, 861, 754, 963.

**DIRECTIONS (Qs. 5 to 7) : Answer the questions based on the following information.**

A word arrangement machine, when given a particular input, rearranges it following a particular rule. Following is the illustration of the input and the steps of arrangement:

- Input :** She was interested in doing art film  
**Step I :** art was she interested in doing film  
**Step II :** art was in she interested doing film  
**Step III :** art was in film she interested doing  
**Step IV :** is the last step of the given input.

Now study the logic and rules followed in the above steps, find out appropriate step for the questions given below for the given input.

5. Which of the following will be last step for the input given below?  
**Input :** He is going out to search air  
 (a) Out is air to going search he  
 (b) Out is air to search going he  
 (c) Search he out is air to going  
 (d) None of the above
6. If step II of an input is not "not is the casino considering legal action", which step is: "not is casino action legal the considering"?  
 (a) Step III               (b) Step VI  
 (c) Step IV               (d) None of the above
7. How many steps will be required to get the final output from the following input?  
**Input:** Father needs to check on the boy  
 (a) Four                   (b) Five  
 (c) Six                   (d) None of the above

**DIRECTIONS (Qs. 8 to 12) : Study the following information carefully and answer the given questions:**

A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement:

- Input :** now 41 28 for join 37 go 61  
**Step I :** 61 now 41 28 for join 37 go  
**Step II :** 61 for now 41 28 join 37 go  
**Step III :** 61 for 41 now 28 join 37 go  
**Step IV :** 61 for 41 go now 28 join 37  
**Step V :** 61 for 41 go 37 now 28 join  
**Step VI :** 61 for 41 go 37 join now 28  
**Step VII :** 61 for 41 go 37 join 28 now  
**Step VII** is the last step for this input.

As per the rules followed in the above steps, find out in each of the following questions the appropriate step for the given input.

8. **Input:** when you 22 special 31 16 47 town  
 Which of the following steps will be the last but one?  
 (a) IV                   (b) VI                   (c) V                   (d) VII
9. **Input:** chair wood 21 42 59 height bench 78  
 How many steps will be required to complete the rearrangement?  
 (a) Three               (b) Four               (c) Five               (d) Six
10. Step IV of an input is :  
*74 again 69 call 17 32 horse desk*  
 of the following is definitely the input?  
 (a) again call 74 69 17 32 horse desk  
 (b) 74 call again 17 69 horse 32 desk  
 (c) call 74 again 69 17 32 desk horse  
 (d) Cannot be determined
11. Step III of an input is :  
*82 brown 74 sugar hobby lady 32 49.*  
 Which of the following will be Step VI?  
 (a) 82 brown 74 hobby 49 sugar lady 32  
 (b) 82 brown 74 hobby 49 lady sugar 32  
 (c) 82 brown 74 hobby 49 lady 32 sugar  
 (d) Cannot be determined
12. **Input:** goal team ask 12 92 85 42 sound  
 Which of the following will be step IV ?  
 (a) 92 ask 85 goal 42 sound 12 team  
 (b) 92 ask 85 goal 42 sound team 12  
 (c) 92 ask 85 goal 42 team 12 sound  
 (d) 92 ask 85 goal team 12 42 sound

**DIRECTIONS (Qs. 13 to 17) : A word arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:**

- Input :** Pull the cover and then push into  
**Step I :** Put the then and cover push into  
**Step II :** then the pull into push cover and  
**Step III :** into pull the then and cover push  
**Step IV :** into pull and then the cover push and so on.

As per the rule followed in the above steps, find out the appropriate step for the given input or vice versa in the following questions.

13. **Input:** Try your best until you get goal  
Which of the following steps would be 'get goal try until you your best'?  
 (a) Step II  
 (b) Step III  
 (c) Step IV  
 (d) get goal try until you your best.
14. If Step VI of an input is 'deep gutter ball into the has fallen', which of the following would definitely be the input?  
 (a) has the ball fallen into deep gutter  
 (b) ball has fallen into the deep gutter  
 (c) deep gutter has fallen into the ball  
 (d) gutter has deep ball fallen into the
15. If Step IV of an input is 'We can't measure the depth without scale', what would be the 7th step?  
 (a) scale we the measure can't depth without  
 (b) the we scale without depth can't measure  
 (c) without we scale the can't measure depth  
 (d) the we depth without scale can't measure
16. **Input:** Standing hard always is impossible for all  
Which of the following will be 8th step for this input?  
 (a) hard all standing is impossible for always  
 (b) hard all impossible is standing for always  
 (c) impossible all hard always for standing is  
 (d) impossible all for always hard standing is
17. If Step 1 of an input is 'Play and jump until you tired fully' what would be step VI of the input?  
 (a) jump full tired you and play until  
 (b) tired fully jump until play and you  
 (c) tired fully play until jump and you  
 (d) play fully tired you and jump until.

**DIRECTIONS (Qs. 18 to 20) :** A word arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement :

- Input : Put pocket hand watch he for them.  
 Step I : Put for he watch hand pocket them.  
 Step II : Put he for watch pocket hand them.  
 Step III : Put hand pocket watch for he them.  
 Step IV : Put pocket hand watch he for them.  
 And so on goes the machine.

Study the logic and answer the questions that follow :

18. If step III of a given input be 'fly sky birds my su fur say', what is the seventh step of the input ?  
 (a) fly sky birds my su fur say  
 (b) fly birds sky my fur su say  
 (c) fly fur su my birds sky say  
 (d) fly su fur my sky birds say
19. If step VII of an input is 'slow ran dhurwa pat hak vi', what is step V of that input ?  
 (a) slow dig hak pat dhurwa ran vi  
 (b) slow hak dig pat ran dhurwa vi  
 (c) slow dhurwa ran pat dig hak vi  
 (d) slow ran dhurwa pat hak dig vi

20. Given the following :  
**Input :** Ana dhir raj ran san rah aji  
 What step will be the following arrangement ?  
**Arrangement :** Ana san rah ran dhir raj aji  
 (a) IV (b) V  
 (c) VI (d) VIII

**DIRECTIONS (Qs. 21 to 25) :** A number arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

- Input: 12, 17, 14, 23, 22, 19, 25, 29  
 Step I: 6, 16, 10, 10, 8, 20, 14, 22  
 Step II: 9, 64, 25, 25, 16, 100, 49, 121  
 Step III: 15, 20, 17, 26, 25, 22, 28, 32  
 Step IV: 19, 29, 23, 41, 39, 33, 45, 53  
 Step V: 3, 8, 5, 5, 4, 10, 7, 11  
 Step VI: 22, 19, 12, 17, 25, 29, 14, 23
21. What will be the sixth step of the following input?  
**Input:** 52, 78, 43, 39, 47, 36, 57, 19  
 (a) 78, 43, 52, 39, 47, 57, 36, 19  
 (b) 47, 36, 52, 78, 57, 19, 43, 39  
 (c) 39, 43, 47, 78, 36, 57, 52, 19  
 (d) 47, 36, 43, 39, 57, 19, 52, 78
22. If the fourth step of a given input is 13, 17, 9, 7, 21, 15, 19 what will be the input?  
 (a) 11, 7, 13, 10, 9, 12, 6  
 (b) 7, 9, 13, 8, 11, 6, 19  
 (c) 21, 7, 10, 6, 12, 9, 5  
 (d) 9, 11, 7, 6, 13, 10, 12
23. If the first step of a given input is 22, 30, 26, 38, 42, 38, 72, 28, what will be step V for the input?  
 (a) 4, 11, 7, 10, 5, 11, 9, 5  
 (b) 9, 13, 11, 7, 15, 19, 5, 28  
 (c) 15, 9, 7, 19, 11, 14, 8, 9  
 (d) 11, 15, 13, 19, 21, 19, 36, 14
24. What will be the third step of the following input?  
**Input:** 26, 29, 32, 35, 38, 41, 44, 47  
 (a) 27, 31, 35, 39, 43, 47, 51, 55  
 (b) 29, 32, 35, 38, 41, 44, 47, 50  
 (c) 23, 26, 29, 30, 33, 36, 40, 45  
 (d) 25, 28, 34, 38, 40, 45, 48, 50
25. What will be the second step of the following input?  
**Input:** 13, 11, 19, 17, 24, 21, 27, 29  
 (a) 69, 81, 72, 85, 96, 63, 54, 87  
 (b) 11, 18, 15, 23, 29, 13, 9, 17  
 (c) 8, 5, 25, 16, 81, 36, 64, 49  
 (d) 16, 4, 100, 64, 36, 9, 81, 121

**DIRECTIONS (Qs. 26 to 32) :** A word arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

- Input** : Punjabi music has rhythm and lively beat.  
**Step I** : music Punjabi has rhythm and lively beat.  
**Step II** : music and Punjabi has rhythm lively beat.  
**Step III** : music and Punjabi rhythm has lively beat.  
**Step IV** : music and Punjabi rhythm has beat lively.  
**Step V** : is the last step of this input.

Now, study the logic and answer the questions that follow:

26. What would be the penultimate step for the following input?

**Input:** Kaho Naa Pyaar Hai is slowly fading

- (a) Naa fading Hai Kaho Pyaar is slowly.
- (b) Naa fading Kaho Pyaar Hai is slowly
- (c) Naa Kaho Pyaar Hai is slowly fading.
- (d) Naa fading Kaho Pyaar Hai slowly is.

27. If step IV of an input is 'scripted are himself both films Amit by', which of the following would be step I of that input?

- (a) scripted are himself both films by Amit
- (b) scripted are both films by Amit himself
- (c) scripted both films are by Amit himself
- (d) Can't be determined

28. **Input:** I am full confidence about my abilities.

What will be the fourth step for this input?

- (a) confidence I full am abilities about my
- (b) confidence I full am about my abilities
- (c) confidence I am full about my abilities
- (d) No such step

29. Which of the following will be last step for the input given below?

**Input:** Fashion no longer hold as much interest.

- (a) hold much Fashion no as longer interest.
- (b) hold much Fashion no longer interest as.
- (c) hold much Fashion no longer as interest.
- (d) hold much no Fashion longer as interest.

30. How many steps will be required to get the final output from the following input?

**Input:** She danced dandia on beats for him

- (a) IV      (b) V      (c) III      (d) VI

31. If step I of an input is 'had remember the poisonous look Minakshi cast' what step would be 'had the Minakshi look remember poisonous cast'?

- (a) VII      (b) III      (c) VI      (d) None of these

32. If step II is 'Puja and wish congratulations heartiest Deepawali for', which of the following would be the input?

- (a) Heartiest congratulations and wish for Deepawali Puja
- (b) Heartiest Deepawali for and puja wish congratulations
- (c) Heartiest Deepawali for puja and wish congratulations
- (d) Can't be determined

**DIRECTIONS (Qs. 33 to 37) :** A word arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

- Input** : and band land hand hind lack job  
**Step I** : hind and band lack land hand job  
**Step II** : hind band land job and lack hand  
**Step III** : hind and lack band hand land job  
**Step IV** : land band and job hand lack hind  
**Step V** : hand land band lack and job hind  
**Step VI** : hand band and hind land lack job and so on.

As per the rule followed in the above steps, find out the appropriate step for the given input or vice versa in the following questions.

33. **Input:** do we he is it at all

which of the following steps would be "all we he is do at it"?

- (a) It is not possible to get the above step.
- (b) Step VI
- (c) Step IX
- (d) Step X

34. If Step IV of an input is "he is to do what her observe", which of the following would definitely be the input?

- (a) to is he what observe her do
- (b) he is to what observe her do
- (c) is he to what observe her do
- (d) Can't say

35. If Step III of an input is

"which then men can how are you"

what would be step VII of the input?

- (a) then can are when you men how
- (b) how are men can you then when
- (c) you then can men are when how
- (d) how can then men are when you

36. **Input:** stejpan mesic is the president of croatia

Which of the following will be step VIII for this input?

- (a) the mesic stejpan president is of croatia
- (b) the is of mesic croatia stejpan president
- (c) sejpan mesic is president croatia of the
- (d) the stejpan mesic of is president croatia

37. If Step V of an input is

"will you hit centuries three again at",

what will be the middle three words of step VII?

- (a) will you hit
- (b) you hit centuries
- (c) hit centuries three
- (d) None of these

**DIRECTIONS (Qs. 38 to 43) :** A word arrangement machine, when given a particular input, rearranges it following a particular rule. The following is the illustration of the input and the steps of arrangement:

**Input** : *The foreign hand is back in action*

**Step I** : hand foreign the in action is back

#### **Step II : the in hand foreign back is action**

### **Step III : is action back foreign hand the in**

#### **Step IV : back action is the in foreign hand**

And so on for subsequent steps. You have to find out the  
and answer the questions given below:

38. Input: *We generally do not focus on them.*

For the above input, which step will be the following arrangement?

**arrangement:** *do on generally not we them focus.*



39. If Step V reads "designer suit reflect not just class but", what will be the middle three words of step I?

- (a) *suit but not*
  - (b) *just class reflect*
  - (c) *designer suit but*
  - (d) *class but suit*

40. If Step II reads “these are clouds over the Indian mind”. what would be the arrangement for Step VIII?

  - (a) clouds are over Indian these mind the
  - (b) over are clouds mind the Indian these
  - (c) over are Indian clouds the mind these
  - (d) over Indian clouds are the mind these

41. If the given input is “not only has he stolen the hearts” what will be Step V?

  - (a) only the has hearts stolen he not
  - (b) he not stolen hearts has only the
  - (c) he not hearts stolen has the only
  - (d) stolen hearts he not the only has

42. If Step VII reads “let us love respect protect these birds”. what will be the arrangement or the Input?

  - (a) protect respect let love birds us these
  - (b) respect love let protect birds us these
  - (c) protect love let respect us birds these
  - (d) protect love let respect birds us these

43. Input: make our planet look beautiful and lively. For the above input, which step will have “make and our planet” as the last four words?

  - (a) Step II    (b) Step III    (c) Step IV
  - (d) There is no such group of words

## SOLUTIONS

- Input :** 655(16), 436(13), 764(17), 799(25), 977(23), 572(14), 333(9)

**Step I :** 333(9), 436(13), 572(14), 799(25), 977(23), 764(17), 655(16)

**Step II :** 333(9), 436(13), 572(14), 799(25), 977(23), 764(17), 655(16)

**Step III :** 333(9), 436(13), 572(14), 655(16), 977(23), 764(17), 799(25)
  - Input :** 544(13), 653(14), 325(10), 688(22), 461(11), 231(6), 857(20)

**Step I :** 231, 653, 325, 688, 461, 544, 857

**Step II :** 231, 325, 653, 688, 461, 544, 857

**Step III :** 231, 325, 461, 688, 653, 544, 857

**Step IV :** 231, 325, 461, 544, 653, 688, 857

**Step V :** 231, 325, 461, 544, 653, 857, 688

Step V is the final output.
  - It is not possible to determine the previous position of the numbers. There is a clear out rule while working forward but no rule for working backward.
  - Input :** 653(14), 963(18), 754(16), 345(12), 364(13), 861(15), 541(10).

**Step I : 541,963,754,345,364,861,653**

**Step II : 541,345,754,963,364,861,653**

**Step III :** 541,345,364,963,754,861,653

- 5-7. In the final output, the words are rearranged based on the last letter in each word. They are in the reverse alphabetical order in the final output. This is done by the method of shifting.

**Input** : She was interested in doing art film.

**Step I** : *art she was interested in doing film*

**Step II** : *art was she interested in doing film*

### **Step III : art was in she interested doing film**

**Step IV : art was in film she interested doing**

5. (b) The final step for the input  
“He is going out to search air” is out is air to search  
going he.

6. (d)

**Step II** : not is the casino considering legal action

**Step III** : not is casino the considering legal action

**Step IV** : not is casino action the considering legal

**Step V** : not is casino action legal the considering

7. (d)  
**Input** : Father needs to check on the boy  
**Step I** : boy father needs to check on the

**Step II** : boy needs father to check on the  
**Step III** : boy needs father to on check the  
**Step III** is the final step.

8-12. Here, it is a case of arrangement.

The logic is the words get arranged in alphabetical order. Whereas the numbers get arranged in descending order. Numbers occupy odd places in the final steps while words occupy even positions. When any element gets arranged, the previous element occupying that position shifts one place towards right.

8. (c) Here, we have to find out the penultimate step, i.e., second-last step.

**Input** : when you 22 special 31 16 47 town

**Step I** : 47 when you 22 special 31 16 town

**Step II** : 47 special when you 22 31 16 town

**Step III** : 47 special 31 when you 22 16 town

**Step IV** : 47 special 31 town when you 22 16

**Step V** : 47 special 31 town 22 when you 16

**Step VI** : 47 special 31 town 22 when 16 you

Here, step VI is the last step. Thus, the penultimate step will be step V

9. (d)

**Input** : chair wood 21 42 59 height bench 78

**Step I** : 78 chair wood 21 42 59 height bench

**Step II** : 78 bench chair wood 21 42 59 height

**Step III** : 78 bench 59 chair wood 21 42 height

**Step IV** : 78 bench 59 chair 42 wood 21 height

**Step V** : 78 bench 59 chair 42 height wood 21

**Step VI** : 78 bench 59 chair 42 height 21 wood

Hence, step VI is the last step.

10. (d) Here, it is a case of arrangement. Therefore, the previous steps can't be obtained with certainty.

11. (b)

**Step III** : 82 brown 74 sugar hobby lady 32 49

**Step IV** : 82 brown 74 hobby sugar lady 32 49

**Step V** : 82 brown 74 hobby 49 sugar lady 32

**Step VI** : 82 brown 74 hobby 49 lady sugar 32

12. (c)

**Input** : goal team ask 12 92 85 42 sound

**Step I** : 92 goal team ask 12 85 42 sound

**Step II** : 92 ask goal team 12 85 42 sound

**Step III** : 92 ask 85 goal team 12 42 sound

**Step IV** : 92 ask 85 goal 42 team 12 sound

- 13-17. Here, the rule followed is:

**Input to step II:** The third and fifth words get interchanged among themselves.

**Step I to Step III:** The group of first three words gets reversed and so does the group of last four.

**Step II to Step III:** The group of first four words gets reversed and so does the group of last three.

**Step III to Step IV:** Same as input to step I.

For convenience, if we assign nos. to each word of the input as pull-1, the -2, cover-3, and -4, then-5, push-6 and into-7, then we get

<b>Input:</b>	1	2	3	4	5	6	7
<b>Step I:</b>	1	2	5	4	3	6	7
<b>Step II:</b>	5	2	1	7	6	3	4
<b>Step III:</b>	7	1	2	5	4	3	6
<b>Step IV:</b>	7	1	4	5	2	3	6
<b>Step V:</b>	4	1	7	6	3	2	5
<b>Step VI:</b>	6	7	1	4	5	2	3
<b>Step VII:</b>	6	7	5	4	1	2	3
<b>Step VIII:</b>	5	7	6	3	2	1	4

13. (d) Input: Try your best until you get goal  
 1 2 3 4 5 6 7

Arrangement: get goal try until you your best

14. (b) **Step VI:** 6 7 1 4 5 2 3

deep gutter ball into the has fallen

**Input:** Ball has fallen into the deep gutter

1 2 3 4 5 6 7

15. (a) 16. (d) 17. (c)

- 18-20. These questions follow the following steps.

<b>Original</b>	1	2	3	4	5	6	7
<b>Step I</b>	1	6	5	4	3	2	7
<b>Step II</b>	1	5	6	4	2	3	7
<b>Step III</b>	1	3	2	4	6	5	7
<b>Step IV</b>	1	2	3	4	5	6	7
<b>Step V</b>	1	6	5	4	3	2	7
<b>Step VI</b>	1	5	6	4	2	3	7
<b>Step VII</b>	1	3	2	4	6	5	7
<b>Step VIII</b>	1	2	3	4	5	6	7

18. (a) Step IV is similar to original statement. Considering step III as original step VII will be the step IV in this output scheme.

19. (b) 20. (c)

- 21-25. Here, the rule followed is:

In Step I : The digits of every number have been added and multiplied by 2.

In Step II: The digits of every number of the input have been added and then the result has been squared.

In Step III: All numbers of the input are added with 3.

In Step IV: Each number of the input is multiplied by 2 and then 5 is subtracted from the product.

In Step V: The digits of every number of the input are summed up.

In Step VI: If we consider the input as four pairs of numbers, the 3rd pair is written first, then the first pair, again the fourth, and at last the second pair.

21. (b) The whole input is divided into 4 groups like (52, 78), (43, 39), (47, 36), (57, 19). Now 3rd, 1st, 4th and 2nd groups are written.

22. (d) Every output will be added to 5 and then divided by 2. The input will come out.

23. (d) The nos. are divided by 2.

24. (b) Every no. is added with 3.

25. (d)

26-32. It is clear that machine is arranging the words of the input neither on the basis of no. of letters in each word nor alphabetical nor change in position in a fixed pattern. But after a keen watch on the last step we find that last letter of each word is in alphabetical order. Now, it can be found that the word whose last letter comes first in English alphabet becomes first and the rest shift one position rightward. Now the word with last letter just after the last letter of the arranged word as in English alphabet becomes second and the rest shift one position rightward and so on.

26. (b) Input : *Kaho Naa Pyaar Hai is slowly fading.*  
 Step I: *Naa Kaho Pyaar Hai is slowly fading.*  
 Step II: *Naa fading Kaho Pyaar Hai is slowly.*  
 Step III: *Naa fading Hai Kaho Pyaar is slowly.*  
 Hence, step II is the penultimate step.

27. (d)            28. (d)            29. (c)  
 30. (a)            31. (d)            32. (d)

33-37. Here, the rule followed is:

P. If Input is 1 2 3 4 5 6 7, then

Step I becomes 5 1 2 6 3 4 7.

Q. If Step I is 1 2 3 4 5 6 7, then

Step II becomes 1 3 5 7 2 4 6.

R. If Step II is 1 2 3 4 5 6 7, then

Step III becomes 1 5 6 2 7 3 4.

S. If Step III is 1 2 3 4 5 6 7 then

Step IV becomes 6 4 2 7 5 3 1.

Again, rules P, Q, R and S are used to get steps V, VI, VII and VIII respectively. The process continues for steps IX, X, ....

For convenience, we assign a letter for each word of the Input:

and A, band -B, land -C, hand -D, hind -E, lack -F, job -G

33. (d) Input: *do we he is it at all*

A B C D E F G

Given step: *all we he is do at it*

G B C D A F E

Now, see the chart. Letters assigned for step X match with the letters obtained for the given step.

34. (a) Step IV: *he is to do what her observe*

C B A G D F E

Input: A B C D E F G

to is he what observe her do

35. (b) Step III: *when then men can how are you*

E A F B D C G

Step VII: D C F B G A E

how are men can you then when

36. (c) Input: *stjepan mesic is the president of croatia*

A B C D E F G

Step VIII: A B C E G F D

*Stjepan mesic is president croatia of the*

37. (d) Step V: *will you hit centuries three again at*

D C B F A G E

Step VII: D C F B G A E

*will you centuries hit again three at*

38-43. Let us find out the logic: In Step I, the first three words get reversed while fourth and sixth, and fifth and seventh interchange their positions. In Step II, the last three words get reversed while the first and third, and second and fourth interchange their positions. In step III, the middle three words get reversed and the alternate words interchange among themselves in the remaining four. From Step III to Step IV, changes are similar to those from Input to Step I. And so on. Now if we mark the words in the input by digits 1 to 7 respectively, the digital arrangement will be :

Input: 1 2 3 4 5 6 7

Step I: 3 2 1 6 7 4 5

Step II: 1 6 3 2 5 4 7

Step III: 4 7 5 2 3 1 6

Step IV: 5 7 4 1 6 2 3

Step V: 4 1 5 7 3 2 6

Step VI: 2 6 3 7 5 4 1

Step VII: 3 6 2 4 1 7 5

Step VIII: 2 4 3 6 5 7 1

38. (c) Input: *We generally do no focus on then*

1 2 3 4 5 6 7

Arrangement: *do on generally not we them focus*

Step VII: 3 6 2 4 1 7 5

39. (a) Step V: *designer suit reflect not just class but*

4 1 5 7 3 2 6

Step I: 3 2 1 6 7 4 5  
suit but not

40. (d) Step II: *these are clouds over the Indian mind*

1 6 3 2 5 4 7

Step VIII: 2 4 3 6 5 7 1

*over Indian clouds are the mind these*

41. (b) Input : *not only has he stolen the hearts*

1 2 3 4 5 6 7

Step V: 4 1 5 7 3 2 6  
he not stolen hearts has only the

42. (d) Step VII: *let us love respect protect these birds*

3 6 2 4 1 7 5

Input: 1 2 3 4 5 6 7  
protect love let respect birds us these

43. (c) Input: *make our planet look beautiful and lively*

1 2 3 4 5 6 7

Hence: *make and our planet*

1 6 2 3

These are the last four words of step IV.

# 9

## CHAPTER

# WORD FORMATION

- This type of questions are simple and can be easily solved. No explanation is required as how to attempt these questions.
- Following examples will help you to solve this type of questions.

### Example 1 :

From the word 'LAPAROSCOPY', how many independent meaningful words can be made without changing the order of the letters and using each letter only once?

- (a) 1
- (b) 2
- (c) 3
- (d) 4

### Solution :

- (b) The words are LAP and COPY.

### Example 2 :

How many meaningful words can be formed with the letters EAML ?

- (a) 1
- (b) 3
- (c) 4
- (d) 2

### Solution :

- (b) MEAL, MALE & LAME

### Example 3 :

If a meaningful word can be formed by rearranging the letters USCALA, the first letter of the word so formed is the answer.

If no such word can be formed, the answer is X.

- (a) C
- (b) S
- (c) A
- (d) L

### Solution :

- (a) The word is CASUAL. The first letter is C.

### Example 4 :

If it is possible to make a meaningful word with the third, the fifth, the eighth and the tenth letters of the word 'DISTRIBUTE', which of the following will be the third letter

of that word? If no such word can be made, give X as the answer and if more than one such word can be made, give M as the answer.

- (a) S
- (b) R
- (c) M
- (d) X

### Solution :

- (b) The third, fifth, eighth and tenth letters of the word DISTRIBUTE are S, R, U and E respectively. The word formed is SURE and its third letter is R.

### Example 5 :

If it is possible to make a meaningful word with the fourth, the seventh, the eleventh and the thirteenth letters of the word 'CATEGORISATION' which of the following will be the first letter of that word? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer.

- (a) O
- (b) R
- (c) M
- (d) X

### Solution :

- (c) The fourth, seventh, eleventh and thirteenth letters of word CATEGORISATION are E, R, T and O respectively. The words formed are TORE and ROTE.

### Example 6 :

If only the consonants in the word MEAT are changed in such a way that each of them becomes the next letter in the English alphabet and the remaining letters are kept unchanged, then how many meaningful words can be formed with the new set of letters using each letter only once in a word ?

- (a) None
- (b) Two
- (c) Three
- (d) One

### Solution :

- (a) M and T are two consonants in the word MEAT. N comes after M and U comes after T. Hence, the letters are N, E, A and U.

## EXERCISE

1. The letters of the name of a vegetable are I, K, M, N, P, P, U. If the letters are rearranged correctly, then what is the last letter of the word formed ?
  - M
  - N
  - K
  - P
2. If it is possible to make a meaningful word with the second, the fifth and the eighth letters of the word 'CARETAKER', which of the following will be the first letter of that word? If no such word can be made, give X as answer. If more than one such word can be made, give M as the answer.
  - A
  - E
  - X
  - M
3. If it is possible to make a meaningful word with the first, the fourth, the seventh and the eleventh letters of the word 'INTERPRETATION', which of the following will be third letter of that word? If more than one such word can be made give M as the answer and if no such word can made, give X as the answer.
  - I
  - R
  - X
  - M
4. If it is possible to make a meaningful word with the third, the fifth, the seventh and the tenth letters of the word 'PROJECTION' which of the following is the third letter of that word? If no such word can be made, give X as the answer. If more than one such word can be made, give M as the answer.
  - O
  - N
  - X
  - M
5. If it is possible to make a meaningful word with the first, the third, the seventh and the ninth letters of the word SEPARATION, which of the following will be the third letter of that word? If no such word can be made, give X as the answer and if more than one such word can be made, give M as the answer.
  - O
  - P
  - M
  - X
6. If the second, third, fifth, eighth and ninth letters of the word CONTEMPLATION are combined to form a meaningful word, what will be the middle letter of that word? If more than one such words can be formed, your answer is X and if no such word can be formed, your answer is Y.
  - X
  - O
  - A
  - Y
7. How many such pairs of letters are there in the word CORPORATE each of which has as many letters in the same sequence between them in the word as in the english alphabet ?
  - None
  - One
  - Two
  - Three
8. If the first three letters of the word COMPREHENSION are reversed, then the last three letters are added and then the remaining letters are reversed and added, then which letter will be exactly in the middle. ?
  - H
  - N
  - R
  - S
9. If the first and second letters in the word DEPRESSION were interchanged, also the third and the fourth letters, the fifth and the sixth letters and so on, which of the following would be the seventh letter from the right ?
  - R
  - O
  - S
  - None of these
10. If the positions of the third and tenth letters of the word DOCUMENTATION are interchanged, and likewise the positions of the fourth and seventh letters, the second and sixth letters is interchanged, which of the following will be eleventh from the right end ?
  - C
  - I
  - T
  - U
11. Arrange the given words in alphabetical order and tick the one that comes in the middle.
  - Restrict
  - Rocket
  - Robber
  - Radom
12. Select the combination of numbers so that letters arranged accordingly will form a meaningful word.
 

R A C E T

1 2 3 4 5

  - 1,2,3,4,5
  - 3,2,1,4,5
  - 5,2,3,4,1
  - 5,1,2,3,4
13. Rearrange the first four letters, in any way, of the word DECISION. Find how many words can be formed by using all the four words.
  - One
  - Two
  - Three
  - More than three

**Directions (Q.14-15) :** In each of the following questions, a group of letters is given which are numbered 1, 2, 3, 4, 5 and 6. Below are given four alternatives containing combinations of these numbers. Select that combination of numbers so that letters arranged accordingly form a meaningful word.

14. I P E L O C

1 2 3 4 5 6

- (a) 1, 4, 3, 5, 2, 6
- (b) 2, 5, 4, 1, 6, 3
- (c) 3, 4, 5, 1, 2, 6
- (d) 4, 5, 1, 2, 3, 6

15. T E L S C A

1 2 3 4 5 6

- (a) 1, 2, 3, 4, 6, 5
- (b) 4, 6, 5, 1, 2, 3
- (c) 5, 6, 4, 1, 3, 2
- (d) 6, 5, 3, 2, 4, 1

16. If it is possible to form a word with the first, fourth, seventh and eleventh letters of the word 'SUPERFLOUS', write the first letter of that word. Otherwise, X is the answer.

- (a) S
- (b) L
- (c) O
- (d) X

**Directions for Q.17:** Question is based on the following alphabet series.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

17. If the alphabet is written in the reverse order and every alternate letter starting with Y is dropped, which letter will be exactly in the middle of the remaining letters of the alphabet.

- (a) M
- (b) N
- (c) O
- (d) M or O

18. How many independent words can 'HEARTLESS' be divided into without changing the order of the letters and using each letter only once?
- (a) Two
  - (b) Three
  - (c) Four
  - (d) Five

19. If the last four letters of the word 'CONCENTRATION' are written in reverse order followed by next two in the reverse order and next three in the reverse order and then followed by the first four in the reverse order, counting from the end which letter would be eighth in the new arrangement?

- (a) N
- (b) T
- (c) E
- (d) R

20. How many independent words can 'STAINLESS' be divided into without changing the order of the letters and using each letter only once?

- (a) Nil
- (b) One
- (c) Two
- (d) Three

21. Select the combination of numbers so that the letters arranged accordingly will form a meaningful word.

VARSTE

- (a) 2, 3, 1, 6, 4, 5
- (b) 4, 5, 2, 3, 1, 6
- (c) 6, 3, 4, 5, 2, 1
- (d) 3, 2, 4, 5, 6, 1

22. If it is possible to make a meaningful word with the third, fifth, eighth and tenth letters of the word 'DISTRIBUTE', which of the following will be the third letter of that word? If no such word can be made give X as the answer.

- (a) S
- (b) R
- (c) E
- (d) X

## SOLUTIONS

1. (b) PUMPKIN
2. (d) The second, fifth and eighth letters of the word CARETAKER are A, T and E respectively. The words formed are EAT, ATE and TEA.
3. (d) The first, fourth, seventh and eleventh letters of the word INTERPRETATION are I, E, R and T respectively. The words formed are TIER, RITE and TIRE.
4. (e) The third, fifth, seventh and tenth letters of the word PROJECTION are O, E, T and N respectively. The words formed are NOTE and TONE.
5. (c) The first, third, seventh and ninth letter of the word SEPARATION are S, P, T and O respectively. The words formed are SPOT, POTS and TOPS.
6. (b) Only one meaningful word 'ALONE' can be made. O is the middle letter.
7. (c)

--	--

C O R P O R A T E

Three pairs — (P, R), (R, T) and (P, O) have as many

letters between them in the word as in the English alphabet. But since the letters must be in the same sequence in the word as in English alphabet, so that desire pairs are (P, R) and (R, T) only.

8. (d) Clearly, we have :

COMPREHENSION → (COM)(PREHENS)(ION)

→ COMIONSNEHERP

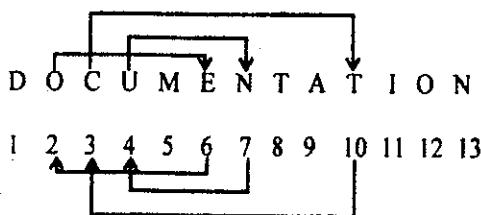
The middle letter is the seventh letter, which is S.

9. (d) The new letter sequence is EDRPSEISNO.

The seventh letter from the right is P.



10. (c)



11. (a) Arranging the words in alphabetical order, we have

Random, Restaurant, Restrict, Robber, Rocket.

So the word in the middle is Restrict and the correct answer is (a).

12. (d) Clearly, the given letters, when arranged in the order 5, 1, 2, 3, 4 from the word 'TRACE'.

13. (a) The first four letters are D, E, C, I and only word DICE can be formed so the answer is (a).

14. (b) POLICE

15. (c) CASTLE

16. (b) The letters selected are S, E, L and S respectively. The word formed is LESS. The first letter is L.

17. (b). Cancelling every second letter after reversing the alphabet the series becomes.

Z X V T R P N L J H F D B

The middle letter is N.

18. (b) The words are HE, ART, LESS

19. (d) The new letter sequence is

NOITARTNECNOC

The eighth letter from the end is R.

20. (c) Only two such words can be formed. The words are STAIN and LESS.

21. (b). Clearly the given letters, when arranged in the order 4, 5, 2, 3, 1, 6 form the word 'STRAVE'.

22. (b). The word formed by S, R, U and E is SURE, USER.

OOO

# 10

## CHAPTER

# LOGICAL VENN DIAGRAMS

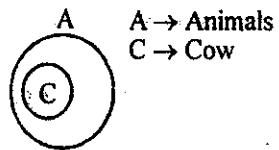
Venn diagram is a way of representing sets pictorially. This idea was developed by John Venn, an English Mathematician.

**Remember:** A set is a collection of well-defined objects, called the elements of the set.

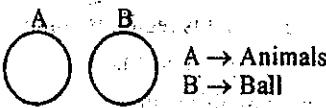
### Representation of different sets

- (A) **Subset :** If one kind of item is completely included by the other.

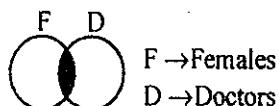
*Example :*



- (B) **Disjoint sets :** If the items are completely exclusive of the other.



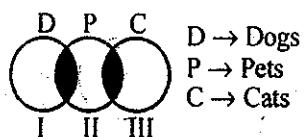
- (C) **Intersection of two sets :** If one kind of item is partially included in other one.



Some females are doctors.

Some doctors are females.

- (D) **Intersection of three sets :** If items are partially included in others.



Some dogs and cats are pets; not all.

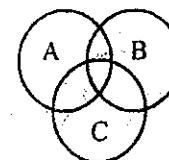
Some pets are neither dogs nor cats.

- (E) If the three items are partly related to each other, they are represented as shown in the adjoining figure.

**Ex :** Clerks, Government Employees, Educated Persons

Clearly, some clerks may be government employees and some

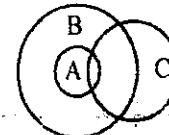
may be educated. Similarly, some government employees may be clerks and some may be educated. Also, some educated persons may be clerks and some may be government employees. So, the given items may be represented as shown in the following figure with three different circles denoting the three classes.



- (F) If one item belongs to the class of second and the third item is partly related to these two, they are represented as shown alongside.

**Ex :** Females, Mothers, Doctors

Clearly, all mothers are females. This would be represented by two concentric circles. But, some females and some mothers can be doctors. So, the circle representing doctors would intersect the two concentric circles. Thus, the diagram becomes as shown in the following figure with circle A representing *Mothers*, circle B representing *Females* and circle C representing *Doctors*.



**Example 1 :**

Diagrammatic representation of the following :

- (1) Women, Doctors, Anchors
- (2) Tall men, Black haired people, Indians
- (3) Mars, Solar System, Universe
- (4) Girls, Boys, Students
- (5) Children, Men, Women

**Solutions :**

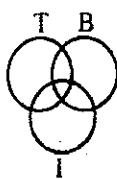
- (1)



D → Doctor  
W → Women  
A → Anchors

Some women are doctors and some are anchors. Among these women, some are both doctors and anchors.

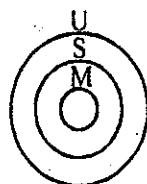
(2)



T → Tall men  
B → Black haired people  
I → Indians

Some Indians are tall men. Some Indians have black hair. Among these Indians, some Indians are tall men with black hair.

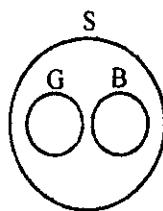
(3)



U → Universe  
S → Solar System  
M → Mars

Universe contains Solar System and Solar System contains Mars.

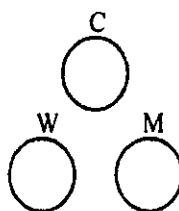
(4)



G → Girls  
B → Boys  
S → Students

Girls and boys are students:

(5)



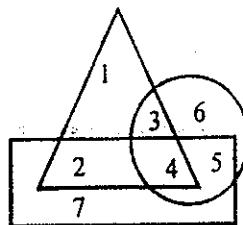
C → Children  
W → Women  
M → Men

Children, Women and Men are three different groups.

★ Some times venn diagram can be represented by different types of geometrical figures.

### Example 2 :

'Triangle' represents young persons, 'circle' represents uneducated persons and 'rectangle' represents employed persons.



### Give the answers of the following questions :

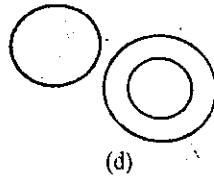
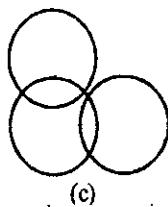
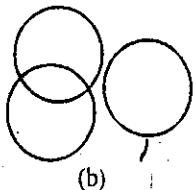
- (1) Which region represents young, uneducated and employed persons?
- (2) Which region represents educated, employed and young persons?
- (3) Which region represents young, educated and unemployed persons?
- (4) Which region represents young, uneducated and unemployed persons?

### Solutions :

- (1) Region – 4, because this region is common to all three.
- (2) Region – 2, because this region is common between young persons and employed persons but not with uneducated.
- (3) Region – 1, because this region contains only young persons not a part of uneducated region and employed region.
- (4) Region – 3, because this region is common between young persons and uneducated persons but not included in employed region.

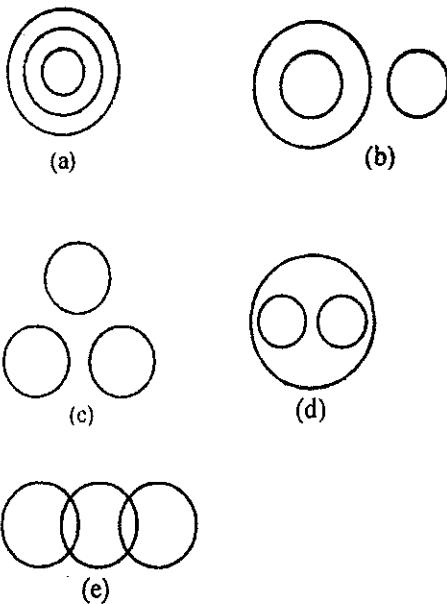
## EXERCISE

1. Which one of the following four logical diagrams represents accurately the relationship between Musicians, Instrumentalists and Violinists?

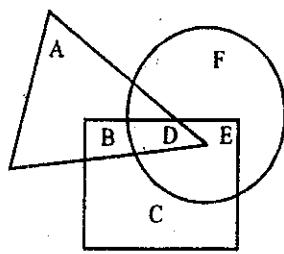


(d)

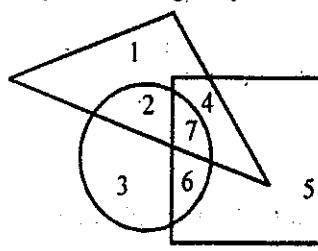
**Directions (Questions 2 to 7) :** Each of the following questions contains three groups of things. You have to choose from the following five diagrams (a), (b), (c), (d) and (e); the diagram that depicts the correct relationship among the three groups of things in each question.



2. Tables, Chairs, Furniture  
 3. Tie, Shirt, Pantaloons  
 4. Dogs, Pets, Cats  
 5. Brinjal, Meat, Vegetables  
 6. Factory, Machinery, Product  
 7. Honesty, Intelligence, Aptitude  
 8. In the given figure, the triangle represents girls, the square represents sports persons and the circle represents coaches. The portion in the figure which represents girls, who are sports persons but not coaches is

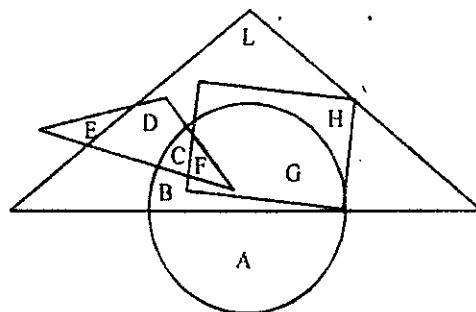


- (a) A                          (b) B  
 (c) D                           (d) E  
 9. If Tall men is equivalent to circle, Army men to triangle and Strong men to square. In figure, different regions are represented by different numbers from 1 to 7. Indicate which number will represent strong army men?



- (a) 3, 4                          (b) 4, 7  
 (c) 5, 7                           (d) 1, 6

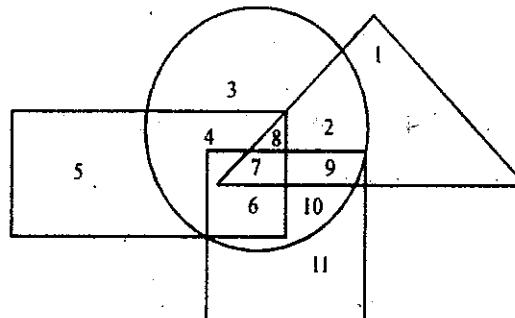
**DIRECTIONS (Qs. 10 to 13) :** In the following figure, the smaller triangle represents teachers; the big triangle represents politicians; circle represents graduates and rectangle represents members of Parliament. Different regions are being represented by letters of English alphabet.



On the basis of the above diagram, answer the following questions :

10. Which among the following regions represent the graduates or teachers but not politicians?  
 (a) B, G                          (b) G, H  
 (c) A, E                           (d) E, F  
 11. Which among the following regions represent the graduate politicians but not the members of Parliament?  
 (a) B, C                           (b) L, B  
 (c) D, L                           (d) A, H, L  
 12. Which among the following regions represent the politicians, who are neither teachers nor graduates?  
 (a) E, F                           (b) D, E  
 (c) C, D                           (d) L, H  
 13. Which among the following regions represent the members of parliament, who are graduate as well as a teacher?  
 (a) G                              (b) F  
 (c) C                              (d) H

**DIRECTIONS (Questions 14 to 18) :** In the following figure, rectangle, square, circle and triangle represent the regions of wheat, gram, maize and rice cultivation, respectively. On the basis of the figure, answer the following questions :



14. Which area is cultivated by all the four commodities?  
 (a) 7                              (b) 8  
 (c) 9                              (d) 2

15. Which area is cultivated by wheat and maize only?

- (a) 8                         (b) 6  
(c) 5                         (d) 4

16. Which area is cultivated by rice only?

- (a) 5                         (b) 1  
(c) 2                         (d) 11

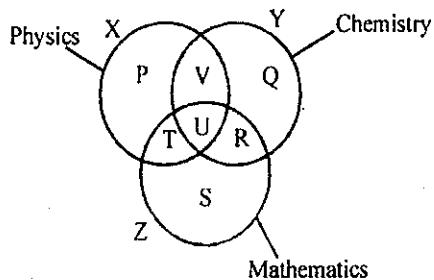
17. Which area is cultivated by maize only?

- (a) 10                         (b) 2  
(c) 3                         (d) 4

18. Which area is cultivated by rice and maize and nothing else?

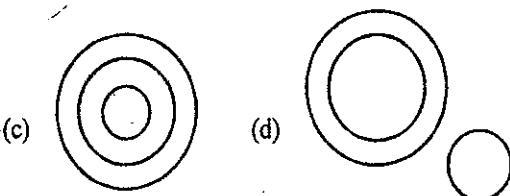
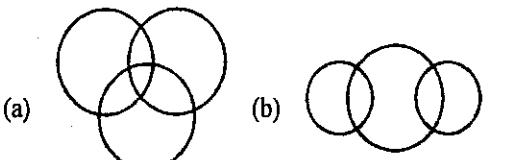
- (a) 9                         (b) 8  
(c) 2                         (d) 7

19. The diagram below represents the students who study Physics, Chemistry and Mathematics. Study the diagram and identify the region which represents the students who study Physics and Mathematics but not Chemistry.

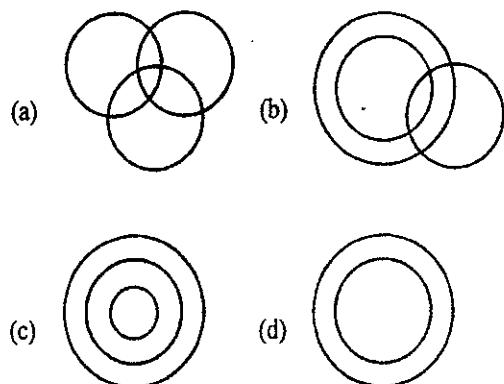


- (a) T                         (b) P + T + S  
(c) V                         (d) P + T + S + R + U + V

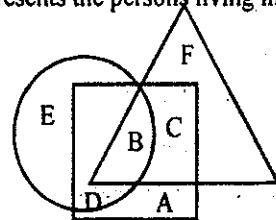
20. Which of the following diagrams correctly represents the relationship among Tennis fans, Cricket players and students.



21. Which of the following diagrams correctly represents the relationship among smokers, bidi smokers, cancer patients.



**Directions : (Q.22-26) :** In the following diagram, three classes of population are represented by three figures. The triangle represents the school teachers, the square represents the married persons and the circle represents the persons living in joint families.



22. Married persons living in joint families but not working as teachers are represented by

- (a) C                         (b) F  
(c) D                         (d) A

23. Persons who live in joint families, are unmarried and who do not work as teachers are represented by

- (a) C                         (b) B  
(c) E                         (d) D

24. Married teachers living in joint families are represented by

- (a) C                         (b) B  
(c) D                         (d) A

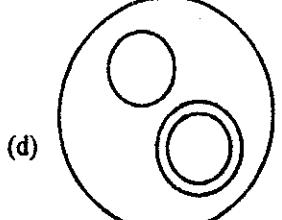
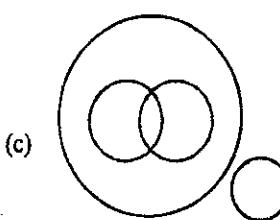
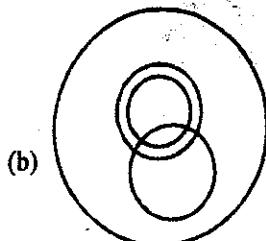
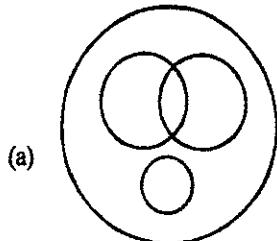
25. School teachers who are married but do not live in joint families are represented by

- (a) C                         (b) F  
(c) A                         (d) D

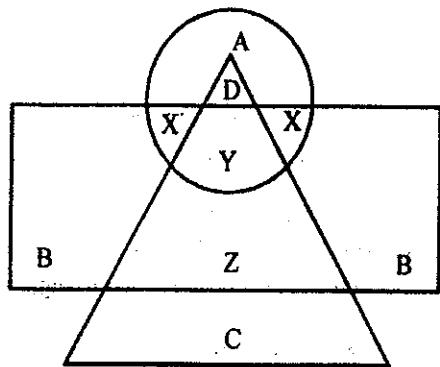
26. School teachers who are neither married nor do live in joint families are represented by

- (a) F                         (b) C  
(c) B                         (d) A

27. In a dinner party both fish and meat were served. Some took only fish and some only meat. There were some vegetarians who did not accept either. The rest accepted both fish and meat. Which of the following logic diagrams correctly reflects this situations ?



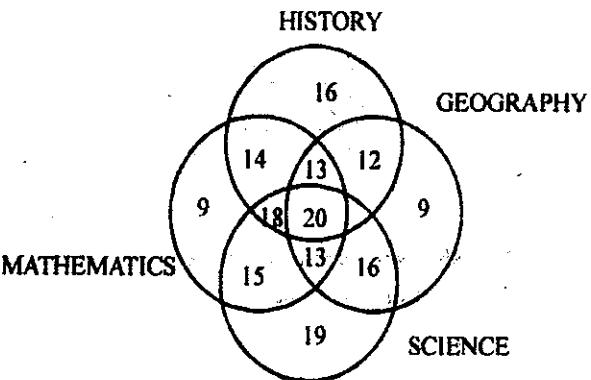
**Directions (Q. 28-32) :** In the following diagram, the circle represents college Professors, the triangle stands for surgical Specialists, and medical Specialists are represented by the rectangle



28. College professors who are also surgical Specialists are represented by  
 (a) A                         (b) B  
 (c) C                         (d) D
29. Surgical Specialists who are also Medical Specialists but not Professors are represented by  
 (a) B                         (b) C  
 (c) X                         (d) Z
30. C represents  
 (a) Medical Specialists  
 (b) College Professors  
 (c) Surgical Specialists  
 (d) Medical and surgical Specialists

31. B represents  
 (a) Professors who are neither Medical nor surgical Specialists  
 (b) Professors who are not surgical Specialists  
 (c) Medical Specialists who are neither Professors nor Surgical Specialists  
 (d) Professors who are not Medical Specialists
32. College Professors who are also Medical Specialists are represented by  
 (a) A                         (b) X  
 (c) Y                         (d) Z

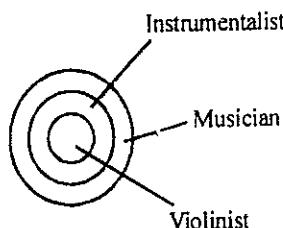
**Directions (Q.33-36) :** Refer to the following Venn diagram :



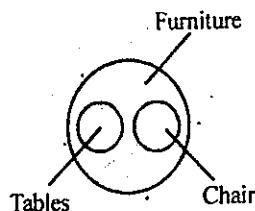
33. The number of students who took any three of the above subjects was  
 (a) 62                         (b) 63  
 (c) 64                         (d) 66
34. The number of students in total, who took History or Mathematics or Science, was  
 (a) 183                         (b) 190  
 (c) 424                         (d) 430
35. The number of students who took both History and Geography among other subjects was  
 (a) 62                         (b) 63  
 (c) 65                         (d) 66
36. Which subject was taken by the largest number of students?  
 (a) Mathematics             (b) Science  
 (c) Geography                 (d) History

# SOLUTIONS

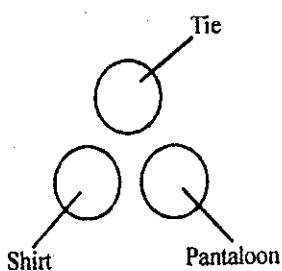
1. (a) All violinists are instrumentalists. All instrumentalists are musicians.



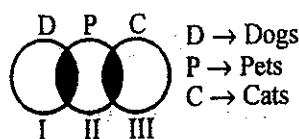
2. (d) Tables and chairs are unrelated items. But, both are items of Furniture.



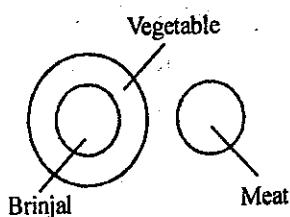
3. (c) Tie, Shirt and Pantaloons are separate items, entirely different from each other.



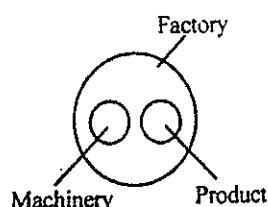
4. (e) Dogs and Cats are entirely different from each other. But, both are pet animals. Some dogs and cats are pets.



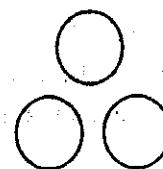
5. (b) Brinjal is a vegetable. But meat is entirely different.



6. (d) Machinery and Product are entirely different. But, both are present in a factory.



7. (c) Aptitude, intelligence and honesty are entirely different.



8. (b) The required region is the region which is common to the triangle and square but lies outside the circle i.e. B.

9. (b) Strong armymen will be represented by the region which is common to the square and the triangle i.e. 4, 7.

10. (c) The persons satisfying the given conditions are denoted by regions which lie inside the smaller triangle or the circle but outside the bigger triangle i.e. A and E.

11. (a) The person satisfying the given conditions are represented by regions which are common to the bigger triangle and the circle but lies outside the rectangle i.e. B and C.

12. (d) The persons satisfying the given conditions are represented by regions which lie inside the bigger triangle but outside the smaller triangle and the circle i.e. I and H.

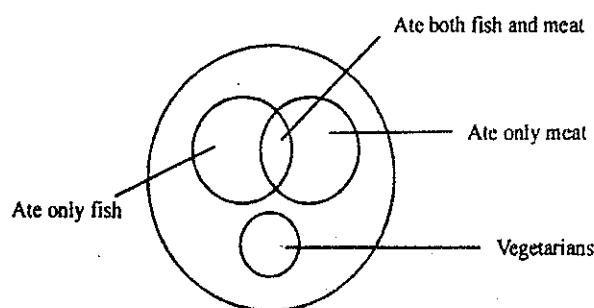
13. (b) The person satisfying the given conditions is represented by the region common to the rectangle, circle and the smaller triangle i.e. F.

14. (a) The required region is the one common to the rectangle, square, circle and the triangle i.e. 7.

15. (d) The required region is the one which is common to only the rectangle and the circle and is not a part of either the triangle or the square i.e. 4.

16. (b) The required region is the one which lies inside the triangle and outside the rectangle, square and circle i.e. 1.

17. (c) The required region is the one which lies inside the circle but outside the rectangle, square and triangle i.e. 3.
18. (c) The required region is the one which is common to only the triangle and the circle i.e. 2.
19. (a) The required region is the one which is common to circles X and Z but lies outside the circle Y i.e. T.
20. (a) From the relationship given in the question, we observe that each of the objects carries something in common to one another. A Tennis fan can be a cricket player as well as student. Hence Diagram (1) represents this relationship.
21. (b) Bidi smokers is a subset of smokers cancer patient may be a smoker, bidi smoker and non-smoker. Hence third object shares a common relationship with first and second object as well.
22. (c) Married persons living in joint families are presented by the region common to the square and the circle i.e., D and B. But, according to the conditions, the persons should not be school teachers. So, B is to be excluded. Hence, the required condition is denoted by region D.
23. (c) Persons living in joint families are represented by the circle. According to the given conditions, the persons should be unmarried and not working as school teachers. So, the region should not be a part of either the square or the triangle. Thus, the given conditions are satisfied by the region E.
24. (b) Married teachers are represented by the region common to the square and the triangle i.e., B and C. But, according to the given conditions, the persons should be living in joint families. So, the required region should be a part of the circle. Since B lies inside the circle, so the given conditions are satisfied by the persons denoted by the region B.
25. (a) As in the above question, married teachers are represented by B and C. But, here, the given conditions lay down that the persons should not be living in joint families. So, the required region should lie outside the circle. Since C lies outside the circle, so the given conditions are satisfied by the persons denoted by the region C.
26. (a) School teachers are represented by the triangle. But according to the given conditions, persons are neither married nor do they live in joint families. So, the region should not be a part of either of either the square or the circle. Such region is F. Hence, the answer is (1).
27. (a)



28. (d) The required region is the one which is common to the circle and the triangle only i.e., D
29. (d) The required region is the one which is common to the triangle and the rectangle but lies outside the circle i.e., Z.
30. (c) C lies inside the triangle only. So, C represents surgical Specialists.
31. (c) B lies inside the rectangle only. So, B represents Medical Specialists who are neither Professors nor surgical Specialists.
32. (b) The required region is the one which is common to the triangle and the circle but lies outside the square i.e., X.
33. (a) The required set of students is denoted by region common to any three circle only  
 $\therefore$  Required number =  $(13 + 13 + 18 + 18) = 62$ .
34. (a) The required set of students is denoted by regions lying inside the circles representing History, Mathematics and Science.  $\therefore$  Required number =  $(9 + 14 + 18 + 15 + 16 + 13 + 13 + 20 + 18 + 13 + 16 + 19) = 183$ .
35. (b) The required set of students is denoted by the regions common to the circles representing History and Geography.  
 $\therefore$  Required number =  $(20 + 13 + 12 + 18) = 63$ .

36. (b) Number of students who took History

$$= (16 + 12 + 18 + 20 + 18 + 14 + 13) = 111.$$

Number of students who took Geography

$$= (9 + 16 + 13 + 20 + 13 + 12 + 18) = 101.$$

Number of students who took science

$$= (19 + 15 + 18 + 20 + 18 + 16 + 13) = 119.$$

Number of students who took mathematics

$$= (9 + 14 + 13 + 20 + 13 + 15 + 18) = 102.$$

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# SYLLOGISM

‘Syllogism’ was introduced by Aristotle. In ‘Syllogism’ a conclusion has to be drawn from two propositions.

**What is a Proposition?**

A proposition is a sentence which comprises a subject, a predicate and a copula. **Subject** is that about which something is said.

**Predicate** is a term which states something about a subject and **copula** is that part of proposition which denotes the relation

between the Subject and the Predicate.

A proposition also known as a **Premises**.

**Examples :** (a) All cows are white  
 Subject      copula      predicate

(b) Some flowers are red  
 Subject      copula      predicate

**Categorical Proposition :** A categorical proposition makes a direct assertion. It has no conditions attached with it.

For examples, ‘All S are P’, ‘Some S are P’, ‘No S is P’ etc.

But ‘Either S or P’, ‘If S, then P’ are not categorical proposition.

**Types of Categorical Proposition :** Categorical proposition has been classified on the basis of quality and quantity of proposition.

**Quantity** represents whether the proposition is universal or particular and **quality** denotes whether the proposition is affirmative or negative.

Hence there are four types of categorical propositions :

- (1) Universal affirmative (A)
- (2) Universal negative (E)
- (3) Particular affirmative (I)
- (4) Particular negative (O)

**1. Universal Affirmative Proposition (denoted by A) :**

A proposition of the form ‘All S are P’ is called a Universal Affirmative Proposition i.e. Universal Affirmative Proposition fully include the subject. Universal affirmative propositions begin with All, Every etc.

**2. Universal Negative Proposition (denoted by E) :**

Universal Negative Proposition fully exclude the subject.

Therefore, a proposition of the form ‘No S is P’ is called a Universal Negative Proposition. It begins with ‘No’, ‘None of the’, ‘Not a single’ etc.

**3. Particular Affirmative Proposition (denoted by I) :**

Particular affirmative proposition partly include the subject.

Hence, a proposition of the form ‘some S are P’ is called a Particular affirmative proposition.

**4. Particular Negative Proposition (denoted by O) :**

A proposition of the form ‘some S are not P’ is called Particular Negative Proposition. Particular Negative Proposition partly exclude the subject.

**SOME DEFINITIONS:**

1. **Major term :** The predicate of the conclusion is called major term.
2. **Middle term :** The common term in the premises is called the middle term.
3. **Minor term :** The subject of the conclusion is called minor term.

**METHOD FOR SOLVING SYLLOGISM :**

**Immediate Inference and Mediate Inference :** Immediate inference is drawn from a single statement whereas the mediate inference is drawn from two statements.

**METHODS FOR IMMEDIATE INFERENCE :**

- (a) **Implication :** In implication, the quantity of a given proposition are changed. The subject, predicate and the quality of proposition remain unchanged. Thus, A will be changed to I and E will be changed to O.

**Examples :**

- (1) Statement : All tables are trees. (A)  
 Conclusion : Some tables are trees. (I)
- (2) Statement : No table is tree. (E)  
 Conclusion : Some tables are not tree. (O)

- (b) **Conversion :** In conversion, the subject becomes the predicate and the predicate becomes the subject. The quantity of the proposition remains unchanged.

Thus, A-type proposition can be converted into I-type.

E-type proposition can be converted into E-type.

I-type proposition can be converted into I-type.

But O-type proposition cannot be converted.

**Examples :**

- (1) Statement : All tables are trees. (A)  
 Conclusion : Some trees are tables. (I)
- (2) Statement : No table is tree. (E)  
 Conclusion : No tree is table. (E)
- (3) Statement : Some tables are trees. (I)  
 Conclusion : Some trees are tables. (I)

**METHOD FOR MEDIATE INFERENCE:**

**Format of the Conclusion** - The conclusion is itself a proposition whose subject is the subject of the first statement and whose predicate is the predicate of the second statement and the common term disappears.

**Example :** All dogs are cats.

All cats are bats.

Conclusion - All dogs are bats.

**STEP I: Aligning** : Two propositions are said to be aligned if the common term is the predicate of the first proposition and the subject of the second one.

If the sentences are not already aligned then they can be aligned by changing the order of the sentences or converting the sentences.

**Example :** All flowers are birds,  
Subject              predicate

All birds are red,  
Subject              predicate

Here, common term is 'birds' and it is the predicate of the first proposition and the subject of second proposition.

**STEP II:** After aligning the two sentences properly, use the following table to draw conclusions.

Type of I prop.	Type of II prop.	Type of conclusion
A	+	A
A	+	E
I	+	A
I	+	E
E	+	A
E	+	I

Here, O\* mean that the conclusion or inference is of type O but the subject of inference is the predicate of the second statement and the predicate of the inference is the subject of the first statement i.e. its format is opposite to the normal format of the conclusion.

**REMARK:**

- There are only 6 cases where a conclusion can be drawn. In other cases, no conclusion can be drawn.  
 $A + I \rightarrow$  No conclusion;  $E + O \rightarrow$  No conclusion.  
 $A + O \rightarrow$  No conclusion;  $I + I \rightarrow$  No conclusion.  
 $E + E \rightarrow$  No conclusion;  $I + O \rightarrow$  No conclusion.
- If two propositions have no common term then no conclusion could be drawn.

**Example 1 :**

Statements : (I) Some cars are roads.  
(II) Some roads are buses.

Since, both statements are I-type, therefore, no mediate conclusion follows. But immediate conclusions can be

followed from conversion of statements (I) and (II).

Conversion of statement I : Some roads are cars.

Conversion of statement II : Some buses are roads.

**Example 2 :**

Statements : (I) Some men are lions.  
(II) All lions are foxes.

Here, some men are lions. – I type

All lions are foxes. – A type.

Conclusion :  $I + A = I$  - type

$\therefore$  Some men are foxes.

Also, conversion of statement I : Some lions are men.

Conversion of statement II : Some foxes are lions.

and Implication of statement II : Some lions are foxes.

**Example 3 :**

Statements : (I) All birds are books.  
(II) All books are cars.

Here, both statements are of A-type.

and  $A + A =$  A-type conclusion.  
All birds are books.

All books are cars.

Conclusions : All birds are cars.  
Some birds are books.

(Implication of statement I)

Some books are cars.

(Implication of statement II)

Some books are birds. (Conversion)

Some cars are books. (Conversion)

**Example 4 :**

Statements : (I) Some dogs are cats.  
(II) No cat is cow.

Since  $I + E =$  O-type conclusion.

Conclusions : Some dogs are not cow.  
Some cats are dogs. (conversion of I)  
Some cats are not cow. (Implication of II)  
No cow is cat. (conversion of II)

**Example 5 :**

Statements : (I) All fathers are sons.  
(II) No son is educated.

Here,  $A + E =$  E-type conclusion.

Conclusions : No father is educated.  
Some fathers are sons. (Implication of I)  
Some sons are fathers. (conversion)  
Some sons are not educated.  
(Implication of II)

**Example 6 :**

Statements : (I) No magazine is cap.  
(II) All caps are cameras.

Since  $E + A =$  O\*-type conclusion.

Conclusions : Some cameras are not magazine.  
Some caps are cameras. (Implication of II)

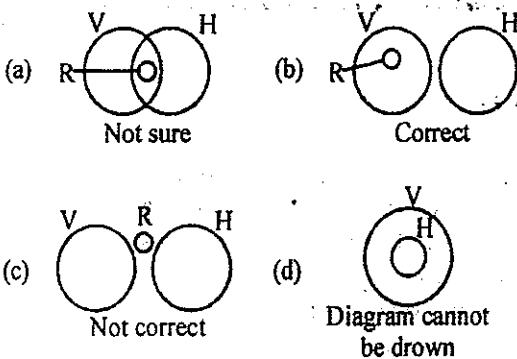
Some magazines are not cap.  
(Implication of I)  
Some cameras are caps. (conversion of II)  
No cap is magazine. (conversion of I)

**Example 7 :**

- Statements :** (I) No table is water.  
(II) Some water are clothes.

Here, E + I = O\*-type conclusion.

- Conclusions :** Some clothes are not tables.  
Some tables are not water.  
(Implication of I)  
No water is table. (conversion of I)  
Some clothes are water. (conversion of II)

**PROBLEMS BASED ON LOGICAL DEDUCTION**

**TYPE I:** In this type of question, five or six statements are given out of which three are logically related to each other. In the three related sentences the third is logically deduced from the first two.

**Example 1 :**

- (A) All heroes can be villains.
  - (B) Ram is a villain.
  - (C) No villain can be a hero.
  - (D) Ram cannot be a hero.
  - (E) All villains cannot be heroes.
  - (F) Ram can be a villain.
- (a) EFD                    (b) BCD  
(c) DCB                    (d) AEC

**Solution :**

Here A, B, C, D, E and F are the six statements. These are followed by four options which give various combinations of three statements out of the six statements.

The correct answer is (b) – BCD

(b) Checking with the options; we have

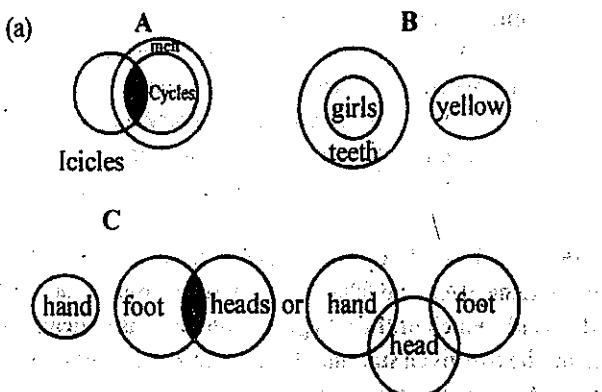
- (a) EFD; All villains cannot be heroes + Ram can be a villain  $\neq$  Ram cannot be a hero.
- (b) BCD; Ram is a villain and No villain can be a hero surely implies that Ram cannot be a hero.

These type of problems can also be showed using venn diagrams.

**TYPE II:** In this type of question, four statements are given. Each statement has 3 segments. Out of the four statements you have to find those statement(s) in which the third segment is logically deduced from the preceding two, but not just from one of them.

**Example 2 :**

- A. Some icicles are cycles; all cycles are men; some icicles are men
  - B. All girls have teeth; no teeth are yellow; no girls have yellow teeth.
  - C. No hand is foot; some foot are heads; some heads are not hands
  - D. Every man has wife; all wives are devoted; no devoted wife has a husband.
- (a) A, B and C only                    (b) A and B  
(c) C and B                            (d) A, B and C and D

**Solution :**

## EXERCISE

**DIRECTIONS (Qs. 1 to 5) :** In each of the questions below are given two or three statements followed by the conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements. Give answer

- (a) if only conclusion I follows.
- (b) if only conclusion II follows.
- (c) if neither I nor II follows.
- (d) if both I and II follow.

1. Statements : All toys are dolls .  
All dolls are jokers.  
Some toys are cars.  
  
Conclusions : I. Some cars are jockers.  
II. Some dolls are cars.
2. Statements : All pens are boxes.  
Some boxes are blades.  
Some blades are files.  
  
Conclusions : I. Some blades are pens.  
II. Some pens are files.
3. Statements : All books are ledgers.  
All pens are keys.  
Some pens are books.  
  
Conclusions : I. Some ledgers are keys.  
II. Some keys are books.
4. Statements : Some roses are thorns.  
All thorns are flowers.  
No flower is a petal.  
  
Conclusions : I. No petal is a rose.  
II. Some flowers are roses.
5. Statements : All leaders are good team workers.  
All good team workers are good orators.  
  
Conclusions: I. Some good team workers are leaders.  
II. All good orators are leaders.

**DIRECTIONS (Qs. 6 - 8) :** In each of these questions, there are two statement A and B followed by two conclusion numbered I and II. Decide which of the two given conclusions logically follows from the two given statements, disregarding commonly known facts. Mark your answer as :

- (a) if only conclusion I follows.
- (b) if only conclusion II follows.
- (c) if neither I nor II follows.
- (d) if both I and II follow.

6. Statements : A: Alcoholic drinks are injurious to health.  
B: All old women drink whisky  
  
Conclusions : I. All old women have poor health.  
II. All young women are in good health.
7. Statements : A: All ants are hardworking.  
B: Some ants are lazy.  
  
Conclusions : I. All lazy are hardworking.  
II. All hardworking are lazy.

8. Statements : A: All rivers are mountains.  
B: Some rivers are deserts.  
  
Conclusions : I. Some mountains are deserts.  
II. Some deserts are not mountains.

**DIRECTIONS (Qs. 9 - 12) :** In each of these questions, there are two statements followed by two possible inference A and B. Assume the statements to be correct even if they vary with facts. Choose your answer as :

- (a) if only inference I follows.
  - (b) If only inference II follows.
  - (c) If both the inference I and II follow.
  - (d) If neither inference I nor II follows.
9. Statements : All graduates are chairs.  
All chairs and tables.  
  
Conclusions : I : All graduates are tables.  
II : All tables are graduates.
10. Statements : Every minister is a student.  
Every student is inexperienced.  
  
Conclusions : I: Every minister is inexperienced.  
II : Some inexperienced are students.
11. Statements : Some teachers are followers.  
Some followers are famous.  
  
Conclusions : I. Some teachers are famous.  
II. Some followers are teachers.
12. Statements : Some dedicated souls are angels.  
All social workers are angels.  
  
Conclusions : I. Some dedicated souls are social workers.  
II. Some social workers are dedicated souls.

**DIRECTIONS (Qs. 13 - 14) :** In each of the questions below are given two or three statements followed by the conclusions numbered I and II. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follows from the given statements. Give answer

- (a) if only conclusion I follows.
  - (b) if only conclusion II follows.
  - (c) either I or II follows.
  - (d) if both I and II follow.
13. Statements : All cups are saucers.  
No saucer is a tray.  
Some trays are bowls.  
  
Conclusions : I. Some bowls are saucers.  
II. No saucer is a bowl.
14. Statements : Ship was overturned.  
Captain was not traced.  
  
Conclusions : I. Captain died in the accident.  
II. Captain is alive.

**DIRECTIONS (Qs. 15 - 26) :** In each of the questions below are given three statements followed by the conclusions numbered I, II, III & IV. You have to take the given statements to be true even if they seem to be at variance with commonly known facts and then decide which of the given conclusions logically follow from the given statements.



- 20.** **Statements :** All books are notes.  
 Some notes are pencils.  
 No pencil is paper.  
**Conclusions :** I. Some notes are books.  
 II. Some pencils are books.  
 III. Some books are papers.  
 IV. No book is a paper.  
 (a) Only I and either III or IV follow  
 (b) Either III or IV follows  
 (c) Only I and III follow  
 (d) None of these

**21.** **Statements :** Some tables are chairs.  
 No cupboard is table.  
 Some chairs are cupboards.  
**Conclusions :** I. Some chairs are not tables.  
 II. All chairs are either tables or cupboards.  
 III. Some chairs are tables.  
 IV. All chairs are tables.  
 (a) Only I and IV follow  
 (b) Only either II or III follows  
 (c) Only I and III follows  
 (d) Either II or III and I follow

**22.** **Statements :** No table is fruit.  
 No fruit is window.  
 All windows are chairs.  
**Conclusions :** I. No window is table.  
 II. No chair is fruit.  
 III. No chair is table.  
 IV. All chairs are windows.  
 (a) None follows      (b) All follow  
 (c) Only I and II follow      (d) Only III and IV follow

**23.** **Statements :** No man is sky.  
 No sky is road.  
 Some men are roads.  
**Conclusions :** I. No road is man.  
 II. No road is sky.  
 III. Some skies are men.  
 IV. All roads are men.  
 (a) None follows      (b) Only I follows  
 (c) Only I and III follow      (d) Only II follows

**24.** **Statements :** All papers are books.  
 All bags are books.  
 Some purses are bags.  
**Conclusions :** I. Some papers are bags.  
 II. Some books are papers.  
 III. Some books are purses.  
 (a) Only I follows      (b) Only II and III follow  
 (c) Only I and III follow      (d) Only I and II follow

**25.** **Statements :** Some stones are bricks.  
 All plants are stones.  
 No flower is a plant.  
**Conclusions :** I. No flower is a stone.  
 II. Some bricks are plants.  
 III. No bricks are plants.  
 (a) Only I follows      (b) Only II follows  
 (c) Only III follows      (d) Either II or III follows

26. Statements : All tigers are jungles.  
No jungle is a bird.  
Some birds are rains.

Conclusions : I. No rain is a jungle.  
II. Some rains are jungles.  
III. No bird is a tiger.

- (a) Only either II or III follows  
(b) Only I and II follow  
(c) Only either I or II and III follow  
(d) None of these

**DIRECTIONS (Qs. 27 - 36) :** Each question contains six statements followed by four sets of combinations of three. Choose the set in which the combinations are logically related.

27. A. All vegetarians eat meat  
B. All those who eat meat are not vegetarians  
C. All those who eat meat are herbivorous  
D. All vegetarians are carnivorous  
E. All those who eat meat are carnivorous  
F. Vegetarians are herbivorous

- (a) BCE (b) ABE  
(c) ACD (d) ACF

28. A. All roses have thorns  
B. All roses have nectar.  
C. All plants with nectar have thorns  
D. All shrubs have roses  
E. All shrubs have nectar  
F. Some roses have thorns
- (a) BEF (b) BCF  
(c) BDE (d) ACF

29. A. No spring is a season  
B. Some seasons are springs  
C. Some seasons are autumns  
D. No seasons are autumns  
E. Some springs are not autumns  
F. All springs are autumns
- (a) DFA (b) BEF  
(c) CEB (d) DEB

30. A. All falcons fly high  
B. All falcons are blind.  
C. All falcons are birds.  
D. All birds are yellow.  
E. All birds are thirsty.  
F. All falcons are yellow.
- (a) ABC (b) CDF  
(c) DEF (d) BCA

31. A. No wires are hooks  
B. Some springs are hooks.  
C. All springs are wires  
D. Some hooks are not wires  
E. No hook is a spring  
F. All wires are springs
- (a) AED (b) BCF  
(c) BEF (d) ACE

32. A. Some abra are dabra

B. All abra are cabra.

C. All dabra are abra.

D. All dabra are cabra.

E. Some cabra are abra.

F. Some cabra are dabra.

- (a) AEF (b) BCF

- (c) ABD (d) BCE

33. A. No plane is a chain

B. All manes are chains.

C. No mane is a plane.

D. Some manes are not planes.

E. Some planes are manes.

F. Some chains are not planes.

- (a) ACD (b) ADF

- (c) ABC (d) CDF

34. A. All dolls are nice

B. All toys are nice

C. All toys are dolls

D. Some toys are nice

E. Some nice things are dolls

F. No doll is nice

- (a) CDE (b) CEF

- (c) ACD (d) BEF

35. A. Some buildings are not sky-scrappers

B. Some sky-scrappers are not buildings.

C. No structure is a sky-scraper

D. All sky-scrappers are structures

E. Some sky-scrappers are buildings

F. Some structures are not buildings

- (a) ACE (b) BDF

- (c) CDE (d) ACF

36. A. All bins are buckets

B. No bucket is a basket

C. No bin is a basket

D. Some baskets are buckets

E. Some bins are baskets

F. No basket is a bin

- (a) BDE (b) ACB

- (c) CDF (d) ABF

**DIRECTIONS (Qs. 37 - 44) :** Each of the questions below contains four arguments of three sentences each. Choose the set in which the third statement is a logical conclusion of the first two.

37. A. No sun is not white; all moon is sun; all moon is white  
B. All windows are open; No open space is allocated; all window is closed space  
C. Some As can sleep late; some Bs wake up early; some As wake up early.  
D. No German can fire; all Americans bombard; both Germans and Americans can fight.
- (a) A only (b) B only  
(c) C only (d) D only



**DIRECTIONS (Qs. 49 - 53) :** In each of these questions, there are given two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts. Read the given conclusions and then decide which of the conclusions logically follows from the two given statements, disregarding commonly known facts.

Mark your answer as

- (a) if only conclusion I follows,
- (b) if only conclusion II follows,
- (c) if either I or II follows,
- (d) if neither I nor II follows.

49. Statements : Some soldiers are famous.

Some soldiers are intelligent.

Conclusions : I. Some soldiers are either famous or intelligent.

II. Some soldiers are neither famous nor intelligent.

50. Statements : Sohan is a good sportsman.

Sportsman are healthy.

Conclusions : I. All healthy persons are sportsmen.

II. Sohan is healthy.

51. Statements : Some sticks are bolts.

Kite is a stick.

Conclusions : I. Some bolts are sticks.

II. Some kites are bolts.

52. Statements : Some men are educated.

Educated persons prefer small families.

Conclusions : I. All small families are educated.

II. Some men prefer small families.

53. Statements : All young scientists are open minded.

No open-minded are superstitious.

Conclusions : I. No scientist is superstitious

II. No young people are superstitious.

**DIRECTIONS (Qs. 54 - 56) :** In each of these questions a few statements are followed by four conclusions numbered I, II, III and IV. Consider the given statements to be true even if they seem to be at variance with commonly known facts. Read all the conclusion(s) and then decide which of the given conclusion(s) logically follow(s) from the given statements.

54. Statements : A. All mirrors are phones.  
B. Some phones are gadgets.  
C. All gadgets are mirrors.

Conclusions : I. Some gadgets are phones.  
II. Some gadgets are mirrors.  
III. Some gadgets are not mirrors.  
IV. Some mirrors are phones.

- (a) Only I and II follow
- (b) None follows
- (c) Only II and III follow
- (d) Either II or IV follow

55. Statements : A. All rackets are jackets.  
B. No cow is cat.

Conclusions : I. Some rackets are not cats  
II. Some cats are jackets.  
III. Some rackets are cats.  
IV. No dog is a cow.

- (a) Only II and IV follow
- (b) Only either I or III and IV follow
- (c) Only III and IV follow
- (d) Only I and IV follow

56. Statements : A. All stairs are lifts.  
B. No lift is an escalator.  
C. Some escalators are helicopters.  
D. Some lifts are planes.

Conclusions : I. No stairs is an escalator.  
II. Some helicopters are not escalators.  
III. Some stairs are planes.  
IV. Some helicopters are escalators.

- (a) Only I and IV follow
- (b) Only I and either II or IV follow
- (c) Either II or IV follows
- (d) Only I, III or IV follow

# SOLUTIONS

1. (d) Statements : All toys are dolls.



All dolls are jokers

Conclusion : All toys are jokers.

[ $A + A = A$ -type conclusion]

Statement : Some toys are cars.

Conclusion : Some cars are toys. (Conversion)



Statement : All toys are jokers.

Conclusion : Some cars are jokers.

( $I + A = I$ -type conclusion)

$\therefore$  I follows.

Some cars are toys



Statement : All toys are dolls.

Conclusions : Some cars are dolls. ( $I + A = I$  type)

Some dolls are cars. (Conversion)

$\therefore$  II follows.

2. (c) Conclusions : Some pens are boxes.

(Implication of first statement)

Some boxes are pens.

(Conversion of first statement)

Some blades are boxes.

(Conversion of second statement)

Some files are blades.

(Conversion of third statement)

No mediate inference follows. Hence, no given Conclusions follows:

3. (d) Statement : Some pens are books.

Conclusion : Some books are pens. (conversion)



Statement : All pens are keys.

Some books are keys.

( $I + A = I$ -type conclusion)

Some keys are books. (Conversion)

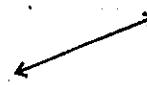
$\therefore$  II follows.

Statements : Some pens are books.



All books are ledgers.

Conclusions : Some pens are ledgers. ( $I + A = I$ -type)  
Some ledgers are pens. (conversion)



Statement : All pens are keys.

Conclusion : Some ledgers are keys. ( $I + A = I$ -type)

$\therefore$  I follows.

4. (b) Statements : Some roses are thorns.



All thorns are flowers.

Conclusions : Some roses are flowers. ( $I + A = I$ -type)  
Some flowers are roses. (conversion)

Hence, II follows.

Statement : No flower is petal.

Conclusion : No petal is flower. (conversion)



Some flowers are roses.

Conclusion : Some roses are not petals.

( $E + I = O^*$ -type)

Hence, I does not follow.

5. (a) Statement : All leaders are good team workers.

Conclusion : Some good team workers are leaders.  
(Conversion)

Hence, I follows.

Statement : All good team workers are good orators.

Conclusion : Some good orators are good team workers. (conversion)

Hence, II does not follow.

6. (c) It cannot be concluded that all old women have poor health or all young women are in good health.

7. (c) Here, one proposition is of particular type, therefore no universal Conclusions can be followed. Hence, neither I nor II follows.

8. (a) Statement : Some rivers are deserts.

Conclusion : Some deserts are rivers. (conversion)



Statement : All rivers are mountains.

Conclusion : Some deserts are mountains.

Conclusion : Some mountains are deserts.

(Conversion)

Hence I follows.

9. (a) **Statements** : All graduates are chairs.



All chairs are tables

**Conclusion** : All graduates are tables.

(A + A = A Type)

Hence I follows.

**Conclusion** : Some tables are graduates.  
(Conversion)

Hence II does not follows.

10. (c) **Statements** : Every minister is a student.



Every student is inexperienced.

**Conclusion** : Every minister is inexperienced.

(A + A = A type)

Hence I follows.

**Statement** : Every student is inexperienced.  
**Conclusion** : Some inexperienced are students.  
(Conversion)

Hence II follows.

11. (b) **Statement** : Some teachers are followers.

**Conclusion** : Some followers are teachers.  
(Conversion)

Hence, II follows.

Since both given statements are I-type, therefore, given Conclusion I does not follow.

12. (d) **Statement** : Some dedicated souls are angles.

**Conclusion** : Some angels are dedicated souls.  
(Conversion)

**Statement** : All social workers are angels

**Conclusion** : Some social workers are angels.  
(Implication)

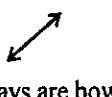
Some angels are social workers.

(Conversion)

No mediate inference follows.

Hence, no given Conclusions follows.

13. (c) **Statements** : No saucer is tray.



Some trays are bowls.

**Conclusion** : Some bowls are not saucer.  
(E + I = O\*-type)

Hence, either Conclusions I or II follows.

14. (c) Either I or II follows.

15. (b) **Statement** : Some pets are buckets

**Conclusion** : Some buckets are pots. (conversion)

**Statement** : Some buckets are bags.

**Conclusion** : Some bags are buckets. (conversion)

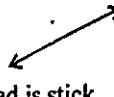
**Statement** : Some bags are purses.

**Conclusion** : Some purses are bags. (conversion)

No mediate inference follows.

∴ No given Conclusions follows.

16. (d) **Statements** : All glasses are roads.



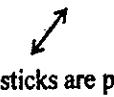
No road is stick.

**Conclusion** : No glass is stick. (A + E = E-type)

**Statement** : Some sticks are pens.

**Conclusion** : Pens are not glass. (E + I = O\* type)

**Statement** : No road is stick.



Some sticks are pens.

**Conclusion** : Some pens are not road.

(E + I = O\* type)

Hence only IV follows.

17. (a) **Statement** : Some ice are ring.

**Conclusion** : Some ring are ice. (conversion)

**Statement** : Some rings are gold.

**Conclusion** : Some gold are ring. (conversion)



**Statement** : No ring is paint.

**Conclusion** : Some gold are not paint.

(I + E = O-type)

**Statements** : Some ice are ring.



No ring is paint.

**Conclusion** : Some ice are not paint.

(I + E = O-type)

**Statement** : No ring is paint.

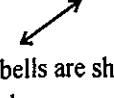
**Conclusion** : No paint is ring. (Implication)

Hence none follows.

18. (d) **Statement** : Some shoes are bells.

**Conclusion** : Some bells are shoes. (conversion)

**Statement** : No candle is bell.



Some bells are shoes.

**Conclusion** : Some shoes are not candle.

(E + I = O\*)

**Statement** : All tables are shoes.

**Conclusions** : Some tables are shoes. (Implication)

Some shoes are tables. (conversion)

**Statement** : No candle is bell.

**Conclusion** : No bell is candle. (conversion)

Hence none follows.

19. (c) Statement : Some cats are rats.  
 Conclusion : Some rats are cats. (conversion)  
 Statement : Some rats are ants.  
 Conclusion : Some ants are rats (conversion)  
 Statement : Some ants are flies.  
 Conclusion : Some flies are ants. (conversion)  
 No mediate inference follows.  
 Hence, only I and II follow.
20. (a) Statement : All books are notes.  
 Conclusions : Some books are notes. (Implication)  
 Some notes are books. (conversion)  
 Hence I follows.  
 Statements : Some notes are pencils.  
  
 Conclusion : Some note are not paper.  
 $(I + E = O \text{ type})$   
 Statement : Some notes are pencils.  
 Conclusion : Some pencils are notes. (conversion)  
 Statement : No pencil is paper.  
 Conclusions : Some pencils are not papers.  
 $(\text{Implication})$   
 No paper is pencil. (Conversion)  
 Since III and IV form a complementary I-E pair, either of the two must follow.
21. (c) Statements : Some tables are chairs.  
 Conclusion : Some chairs are tables. (conversion)  
 Hence, III follows.  
 Statement : No cupboard is table.  
 Conclusions : Some cupboards are not table.  
 $(\text{Implication})$   
 No table is cupboard. (conversion)  
 Statement : Some chairs are cupboards.  
 Conclusions : Some cupboards are chairs.  
 $(\text{conversion})$   
 Since, No table is cupboard.  
  
 Conclusion : Some chairs are not-table.  
 $(E + I = O^* \text{ type})$   
 Hence, I follows.
22. (a) Statement : No table is fruit.  
 Conclusions : Some tables are not fruit. (Implication)  
 No fruit is table. (conversion)  
 Statement : No fruit is window.  
 Conclusions : Some fruits are not window.  
 $(\text{Implication})$   
 No window is fruit. (Conversion)

- Statements : No fruit is window  
  
 All windows are chairs.  
 Conclusion : Some chairs are not fruit.  
 $(E + A = O^* \text{ type})$   
 Statement : All windows are chairs.  
 Conclusions : Some windows are chairs.  
 $(\text{Implication})$   
 Some chairs are windows.  
 $(\text{Conversion})$   
 Hence none follows.
23. (d) Statement : No man is sky.  
 Conclusions : Some men are not sky. (Implication)  
 No sky is man. (conversion)  
 Statement : No sky is road.  
 Conclusions : Some skies are not road. (Implication)  
 No road is sky. (conversion)  
 Hence II follows.  
 Statements : Some men are roads.  
 Conclusions : Some roads are men. (conversion)  
 No sky is man.  
  
 Some men are roads.  
 Some roads are not sky.  
 $(E + I = O^* \text{ type})$   
 No sky is road.  
  
 Some roads are men.  
 Some men are not sky.  
 $(E + I = O^* \text{ type})$   
 Statements : Some men are roads.  
  
 No road is sky.  
 Conclusion : Some men are not sky. ( $I + E = O \text{ type}$ )  
 Statements : Some roads are men.  
  
 No road is sky.  
 Conclusion : Some roads are not sky. ( $I + E = O^* \text{ type}$ )  
 Hence, only II follows.
24. (b) Statement : All papers are books.  
 Conclusions : Some papers are books. (Implication)  
 Some books are papers. (conversion)  
 Hence II follows.

**Statement** : All bags are books.

**Conclusions** : Some bags are books. (Implication)  
Some books are bags. (conversion)

**Statement** : Some purses are bags.

**Conclusion** : Some bags are purses. (conversion)

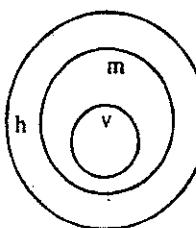
**Statements** : Some purses are bags.

All bags are books.

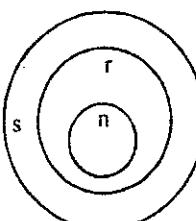
**Conclusions** : Some purses are books. (I + A = I-type)  
Some books are purses. (conversion)

Hence, III follows.

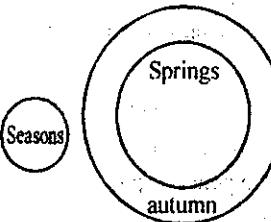
27. (d)



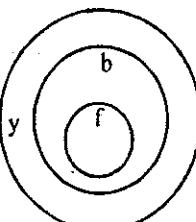
28. (c)



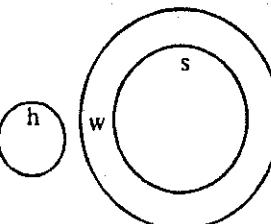
29. (a)



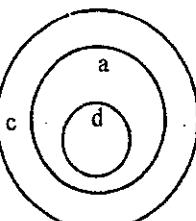
30. (b)



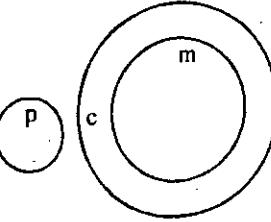
31. (d)



32. (b)



33. (c)



25. (d) **Statement** : Some stones are bricks.

**Conclusion** : Some bricks are stone. (conversion)

**Statement** : All plants are stones.

**Conclusions** : Some plants are stones. (Implication)  
Some stones are plants. (conversion)

**Statement** : No flower is a plant.

**Conclusions** : Some flowers are not plant.  
(Implication)

No plant is flower. (Conversion)

**Statements** : No flower is plant.

All plants are stones.

**Conclusions** : Some stones are not flower.

(E + A = O\* type)

Since, II and III form a complementary I-E pair, either of two must follow.

26. (c) **Statement** : All tigers are jungles.

**Conclusions** : Some tigers are jungles. (Implication)  
Some jungles are tigers. (conversion)

**Statement** : No jungle is a bird.

**Conclusions** : Some jungle are not bird. (Implication)  
No bird is jungle. (conversion)

**Statement** : Some birds are rains.

**Conclusion** : Some rains are birds. (conversion)

**Statements** : All tigers are jungles.

No jungle is bird.

**Conclusions** : No tiger is bird. (A + E = E-type)  
No bird is tiger. (conversion)

Hence III follows.

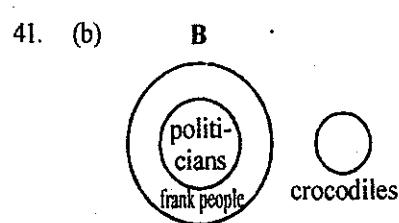
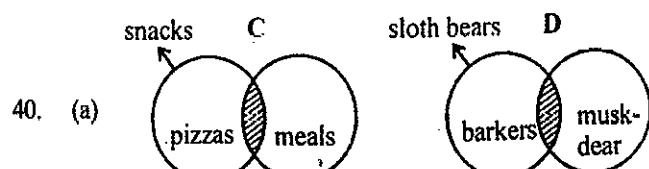
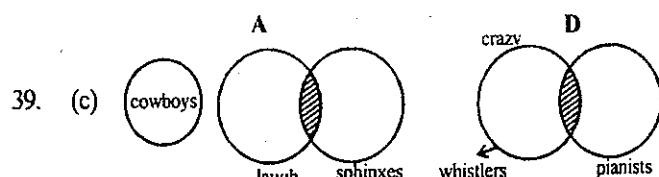
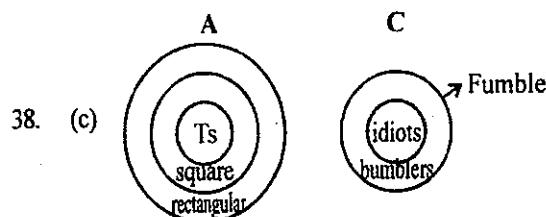
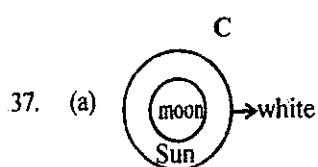
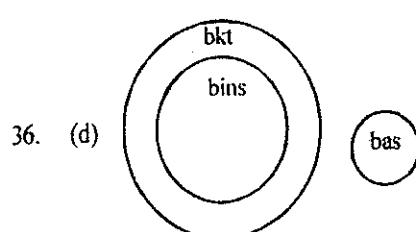
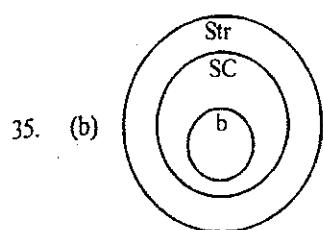
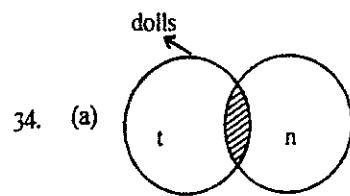
**Statements** : No jungle is bird.

Some birds are rains.

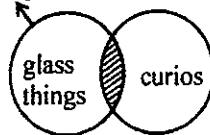
**Conclusions** : Some rains are not jungle.

(E + I = O\* type)

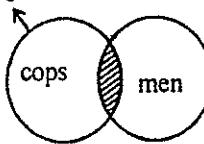
Since I and II form a complementary E-I pair, either of two must follow.



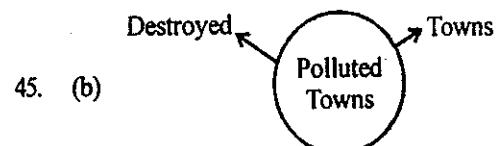
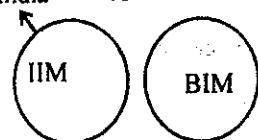
42. (b) transparent B



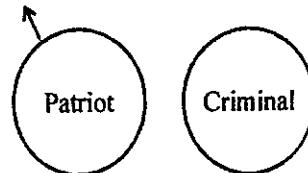
43. (d) brave C



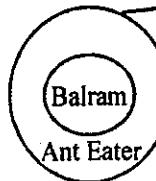
44. (c) India A



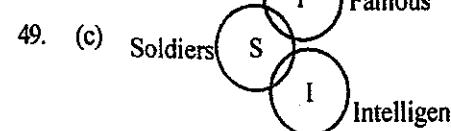
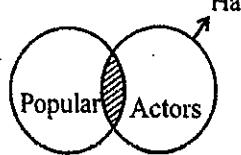
46. (a) Bundledas



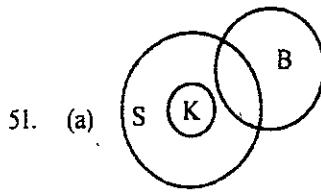
47. (d)



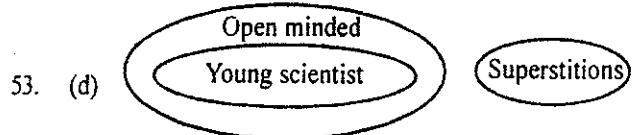
48. (b)



50. (b) Sportsman are healthy and sohan is sportsman  
 $\therefore$  Sohan is healthy.

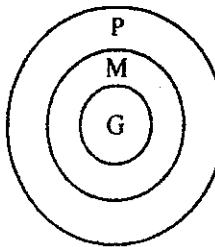


52. (b) Some men are educated and educated persons prefer small families  
 $\therefore$  Some men prefer small families.



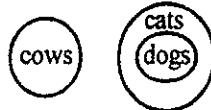
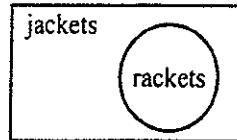
I does not follow because statements indicate only Young Scientists.

54. (b)

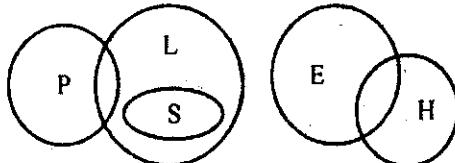


None of the conclusions follows.

55. (b)



56. (b)



I, II or IV follow.

OOO

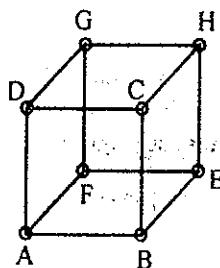
# 12

CHAPTER

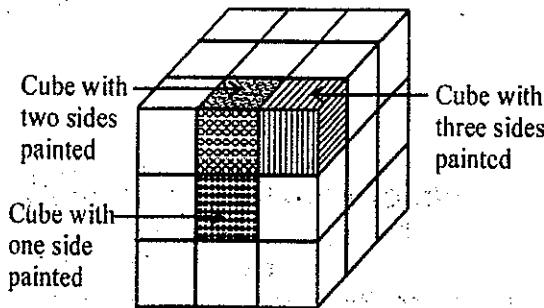
# CUBE

## What is a cube?

A cube is three dimensional figure whose length, breadth and height are equal and any two adjacent faces are inclined to each other at  $90^\circ$ . It has 6 faces, 8 corners and 12 edges.



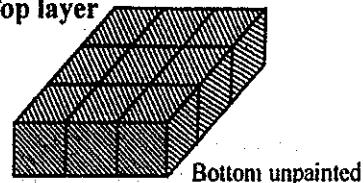
- Corners of the cube are A, B, C, D, E, F, G and H.
- Edges of the cube are AB, BE, EF, AF, AD, CD, BC, EH, CH, GH, DG and FG.
- Faces of the cube are ABCD, EFGH, CDGH, BCHE, ABEF and ADFG.
- When a cube is painted on all of its faces with any colour and further divided into various smaller cubes of equal size, we get following results :
  - Smaller cubes with no face painted will present inside faces of the undivided cube.
  - Smaller cubes with one face painted will present on the faces of the undivided cube.
  - Smaller cubes with two faces painted will present on the edges of undivided cube.
  - Smaller cubes with three faces painted will present on the corners of the undivided cube.



The above figure may be analysed by dividing it into three horizontal layers :

**Layer I or Top Layer :** The central cube has only one face coloured, four cubes at the corner have three faces coloured and the remaining 4 cubes have two faces coloured.

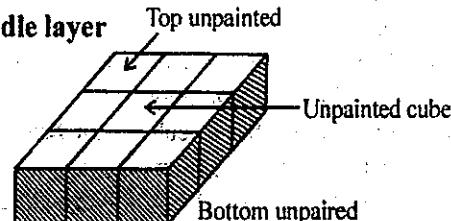
Top layer



Bottom unpainted

**Layer II or middle layer :** The central cube has no face coloured, the four cubes at the corner have two faces coloured and the remaining 4 cubes have only one face coloured.

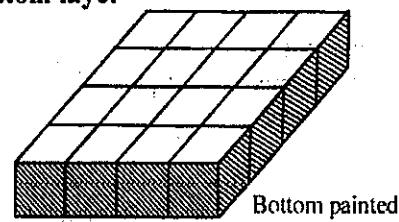
Middle layer



Bottom unpainted

**Layer III or bottom layer :** The central cube has only one face coloured, four cubes at the corner have three faces coloured and the remaining 4 cubes have two faces coloured.

Bottom layer



Also, if  $n = \text{no. of divisions on the faces of cube}$

$$= \frac{\text{Length of the edge of undivided cube}}{\text{Length of the edge of one smaller cube}}$$

Then,

- Number of smaller cubes with no face painted  $= (n-2)^3$
- Number of smaller cubes with one face painted  $= (n-2)^2 \times 6$
- Number of smaller cubes with two faces painted  $= (n-2) \times 12$
- Number of smaller cubes with three faces painted  $= 8$

### *Example 1:*

A cube is painted blue on all faces is cut into 125 cubes of equal size. Now, answer the following questions :



*Solution:*

Since there are 125 smaller cubes of equal size, therefore,  
 $n = \text{no. of divisions on the face of undivided cube} = 5$ .

- (i) (d) Number of cubes with no face painted =  $(n - 2)^3$   
 $= (5 - 2)^3 = 27$

(ii) (d) Number of cubes with one face painted =  $(n - 2)^2 \times 6$   
 $= (5 - 2)^2 \times 6$   
 $= 54$

*Example 2:*

A cube of side 4 cm is painted black on the pair of one opposite surfaces, blue on the pair of another opposite surfaces and red on remaining pair of opposite surfaces. The cube is now divided into smaller cubes of equal side of 1 cm each. Then,

- I. Find the number of smaller cubes with three surfaces painted.

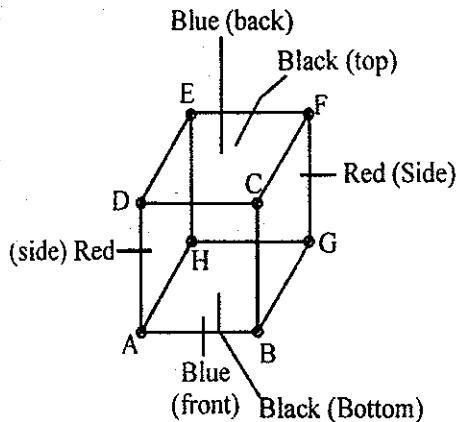
II. Find the number of smaller cubes with two surfaces painted.  
And out of this

  - (i) Find the number of cubes with two surfaces painted with black and blue colour.
  - (ii) Find the number of cubes with two surfaces painted with blue and red colour.
  - (iii) Find the number of cubes with two surfaces painted with black and red colour.

III. Find the number of smaller cubes with one surface painted.  
And out of this

  - (i) Find the number of cubes with one surface painted with black colour.
  - (ii) Find the number of cubes with one surface painted with blue colour.
  - (iii) Find the number of cubes with one surface painted with red colour.

*Solution :*



Here,  $n = \frac{4}{1} = 4$

- I. Number of smaller cubes with three surfaces painted = 8  
 (All three surfaces painted with different colours black, blue and red)

II. Number of smaller cubes with two surfaces painted  

$$= (4 - 2) \times 12 = 24$$

Now, let faces ABCD and EFGH are painted with Blue.  
 Faces BCFG and ADEH are painted with Red.  
 Faces ABGH and CDEF are painted with Black.  
 Therefore,

  - (i) Number of cubes with two surfaces painted with black and blue colour = 2(cubes along with edge AB) + 2(cubes along with edge CD) + 2(cubes along with edge GH) + 2(cubes along with edge EF) = 8
  - (ii) Number of cubes with two surfaces painted with blue and red colour = 2(cubes along with edge AD) + 2(cubes along with edge BC) + 2(cubes along with edge FG) + 2(cubes along with edge EH) = 8
  - (iii) Number of cubes with two surfaces painted with black and red colour = 2(cubes along with edge DE) + 2(cubes along with edge CF) + 2(cubes along with edge BG) + 2(cubes along with edge AH) = 8

III. Number of smaller cubes with one surfaces painted  

$$= (4 - 2)^2 \times 6 = 24$$

  - (i) Number of cubes with one surface painted with black colour = 4(cubes on face ABGH) + 4(cubes on face CDEF) = 8
  - (ii) Number of cubes with one surface painted with blue colour = 4(cubes on edge face ABCD) + 4(cubes on edge face EFGH) = 8
  - (iii) Number of cubes with one surface painted with red colour = 4(cubes on edge face ADEH) + 4(cubes on edge face BCFG) = 8

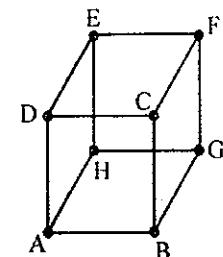
**Example 3 :**

A cube is painted red on two adjacent faces and on one opposite face, yellow on two opposite faces and green on the remaining face. It is then cut into 64 equal cubes.

How many cubes have only one red coloured face?



*Solution :*



Let faces ABCD, ABGH and CDEF are painted with red colour.

Faces BCFG and ADEH are painted with yellow and EFGH is painted with green colour.

Clearly the cubes which have only one red coloured face and all other faces uncoloured are the four central cubes at each of the three faces ABCD, ABGH and CDEF. Thus, there are  $4 \times 3 = 12$  such cubes.

**DIRECTIONS**(for Examples 4 to 7): Read the information given below to answer the questions that follow.

- I. A cube has six sides, each of which has a different colour : black, blue, brown, green, red and white.
  - II. The red side is opposite the black.
  - III. The green side is between the red and the black.
  - IV. The blue side is adjacent to the white.
  - V. The brown side is adjacent to the blue.
  - VI. The red side is the bottom face.

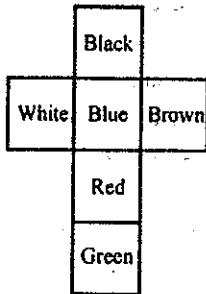
 *Example 4:*

The four colours adjacent to green are :

- (a) black, blue, brown, red
  - (b) black, blue, brown, white
  - (c) black, blue, red, white
  - (d) black, brown, red, white

 **Solution :**

- (d) When the cube is unfolded, it will look like as



The four colours adjacent to green are black, brown, red and white.

---

**Example 5**

Which of the following can be deduced from the statements I, II and VI?

- (a) Black is on the top  
 (b) Blue is on the top  
 (c) Brown is on the top  
 (d) Brown is opposite to black

### **Solution .**

- (a) The red side is opposite to the black. Therefore, if red is at the bottom, black will be at the top.

### **Example 6 :**

Which of the following statements given above adds no information?



**Solution :**

- (d) VI does not add to the information provided by I – V.

*Example 7 :*

If the red side is exchanged for the green side and the blue is swapped for black, then which of the following is false ?

- (a) Red is opposite to black.
  - (b) White is adjacent to brown.
  - (c) Green is opposite to blue.
  - (d) White is adjacent to blue.

**Solution :**

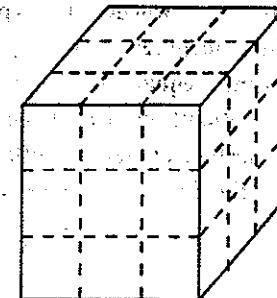
- (b) Adjacent to white, we have brown.

## **EXERCISE**

**DIRECTIONS (Qs. 1 - 4) :** A cube is coloured red on all faces. It is cut into 64 smaller cubes of equal size. Now, answer the following questions based on this statement :



**DIRECTIONS (Qs. 5 - 9) :** A wooden cube is painted Blue on all the four adjoining sides and Green on two opposite sides i.e. top and bottom. It is then cut at equal distances at right angles four times vertically (top to bottom) and two times horizontally (along the sides) as shown in the figure where the dotted lines represent the cuts made. Study the diagram and answer the following questions :



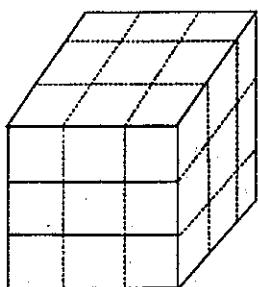
**DIRECTIONS (Qs. 10 - 12) :** Three adjacent faces of a cube are coloured blue. The cube is then cut (once horizontally and once vertically) to form four cuboids of equal size, each of these cuboids is coloured pink on all the uncoloured faces and is then cut (as before) into four cuboids of equal size.

10. How many cuboids have two faces coloured pink?  
(a) 1      (b) 3      (c) 4      (d) 6
11. How many cuboids have three faces coloured pink?  
(a) 9      (b) 7      (c) 5      (d) 3
12. How many cuboids have three faces coloured blue?  
(a) 4      (b) 2      (c) 1      (d) 0

**DIRECTIONS (Qs. 13 - 17) :** A cube painted red on two adjacent faces and black on the faces opposite to the red faces and green on the remaining faces, is cut into sixty-four smaller cubes of equal size.

13. How many cubes are there which have no face painted?  
(a) 0      (b) 4      (c) 8      (d) 16
14. How many cubes have only one face painted?  
(a) 8      (b) 16      (c) 24      (d) 32
15. How many cubes have less than three faces painted?  
(a) 8      (b) 24      (c) 28      (d) 48
16. How many cubes are there with three faces painted?  
(a) 4      (b) 8      (c) 16      (d) 24
17. How many cubes have one face green and one of the adjacent faces black or red?  
(a) 8      (b) 16      (c) 24      (d) 28

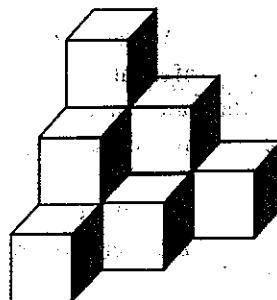
**DIRECTIONS (Qs. 18 - 20) :** A wooden cube is painted blue on all the four adjoining sides and green on two opposite sides i.e. top and bottom. It is then cut at equal distances at right angles four times vertically (top to bottom) and two times horizontally (along the sides) as shown in the figure when the dotted lines represent the cuts made. Study the diagram and answer the following questions:



18. How many cubes will have one face painted only in Blue  
(a) 1      (b) 2      (c) 3      (d) 4
19. How many cubes will have one face painted only in Green  
(a) 1      (b) 2      (c) 3      (d) 4
20. How many cubes are formed in all?  
(a) 16      (b) 24      (c) 27      (d) 32

**DIRECTIONS (Qs. 21 - 26) :** A cube painted red on two adjacent faces and black on the faces opposite to the red faces and green on the remaining faces is cut into sixty-four smaller cubes of equal size.

21. How many cubes are there which have no face painted –  
(a) 0      (b) 4      (c) 8      (d) 16
22. How many cubes have only one face painted –  
(a) 8      (b) 16      (c) 24      (d) 32
23. How many cubes have less than three faces painted –  
(a) 8      (b) 24      (c) 28      (d) 48
24. From a  $10 \times 10 \times 10$  cube, which is formed by combinations of  $1 \times 1 \times 1$  cubes, a layer of the smaller cubes is removed. What will be the number of  $1 \times 1 \times 1$  cubes present in this new cube?  
(a) 900      (b) 488      (c) 512      (d) 729
25. A  $5 \times 5 \times 5$  cube is formed by using  $1 \times 1 \times 1$  cubes. If we add another layer of such  $1 \times 1 \times 1$  cube in the  $5 \times 5 \times 5$  cube. What will be the number of  $1 \times 1 \times 1$  cubes in the newly formed cube?  
(a) 216      (b) 343      (c) 294      (d) 264
26. Count the number of cubes in the given figure



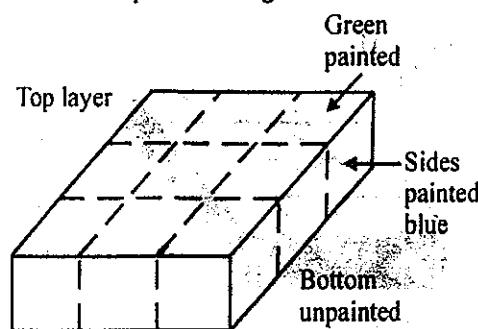
- (a) 14      (b) 12      (c) 10      (d) 8

# SOLUTIONS

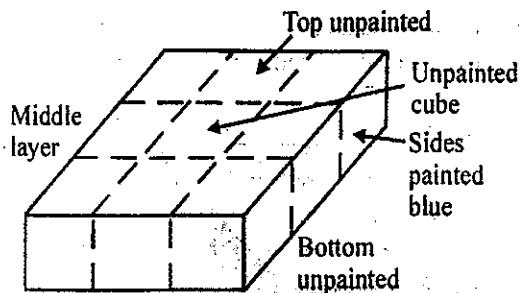
- 1-4. Since, there are 64 smaller cubes of equal size, therefore,  
 $n = \text{no. of divisions on the face of undivided cube} = 4$
1. (c) no. of cubes with no face coloured =  $(n - 2)^3 = (4 - 2)^3 = 8$
  2. (d) no. of cubes with one face painted =  $(n - 2)^2 \times 6 = (4 - 2)^2 \times 6 = 24$
  3. (a) no. of cubes with two red opposite faces = 0  
 (none of the cubes can have its opposite faces coloured)
  4. (c) Number of cubes with three faces coloured  
 $= 4(\text{cubes at top corners}) + 4(\text{cubes at bottom corners}) = 8$

- 5-9. The figure may be analysed by dividing it into three horizontal layers :

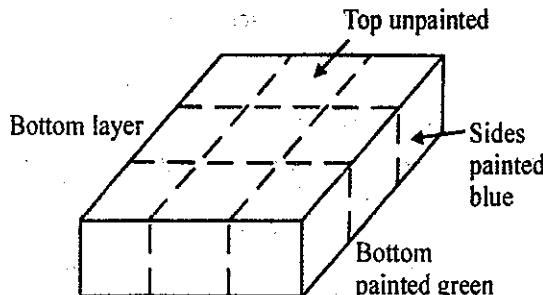
In the top layer, the central cube has only one face painted green, the four cubes at the corner have three faces painted one face green and two faces blue. The remaining four cubes have two faces painted one green and one blue.



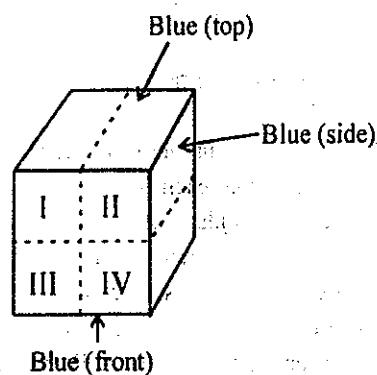
In the middle layer, the central cube has no any face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.



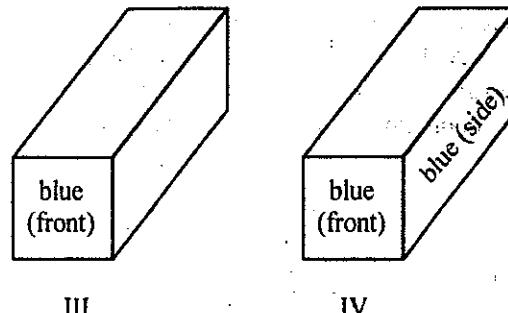
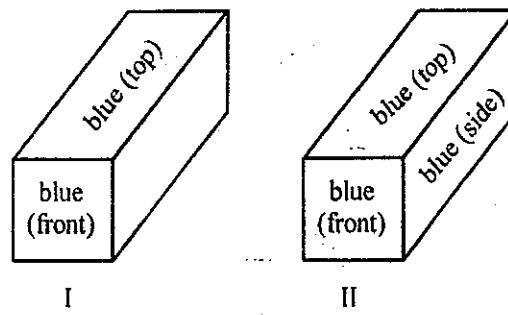
In the bottom layer, the central cube has one face painted green and four cubes at the corners have three faces painted—two blue and one green. The remaining four cubes have two faces painted—one blue and one green.



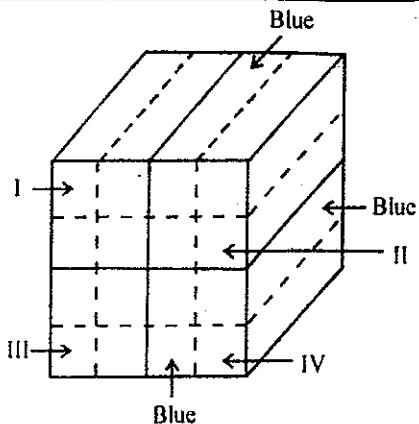
5. (d) There are four cubes in the middle layer which have one face painted only in blue.
  6. (b) There is one (central) cube in the top layer and one (central) cube in the bottom layer which have one face painted only in Green.
  7. (c) There are 9 cubes in each of the three layers. Thus there are 27 cubes in all.
  8. (a) number of cubes with three sides painted = 4[cubes in the top corners + 4[cubes in the bottom corners] = 8 cubes
  9. (d) Only one central cube in the middle layer has no faces painted at all.
- 10-12. The adjoining figure shows the cube coloured and cut into four cuboids as stated in the question.



Four cuboids are obtained as shown below :



Now, all uncoloured faces of each cuboid are coloured with pink and then again cut each cuboid into four cuboids.



In set I and IV : 2 cuboids have 2 faces blue, 2 faces pink and 2 faces uncoloured each. 2 cuboids have 1 face blue, 3 faces pink and 2 faces uncoloured each.

In set II : 2 cuboids have 2 faces blue, 2 faces pink and 2 faces uncoloured each.

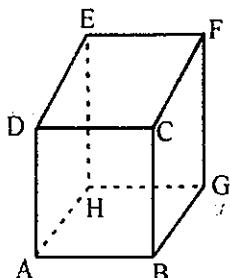
1 cuboid has 3 faces blue, 1 face pink and 2 faces uncoloured each.

1 cuboid has 1 face blue, 3 faces pink and 2 faces uncoloured each.

In set III : All the four cuboids have 1 face blue, 3 faces pink and 2 faces uncoloured each.

10. (d) There are 2 cuboids in set I, 2 cuboids in set II and 2 cuboids in set IV having 2 faces pink in each. Thus, there are  $2 + 2 + 2 = 6$  such cubes.
11. (a) There are 2 cuboids in set I, 1 cuboid in set II, 4 cuboids in set III and 2 cuboids in set IV having 3 faces pink each. Thus, there are 9 such cuboids.
12. (c) There is only one cuboid having three faces blue. This cuboid lies in set II.

13-17.



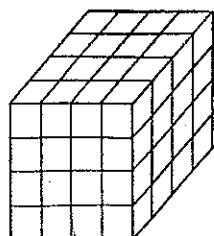
Here,

Faces ABCD, BCFG are painted with red.

Faces ADEH, EFGH are painted with black.

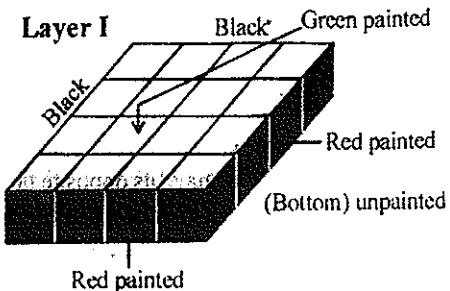
Faces CDEF, ABGH are painted with green.

No. of divisions on the faces of cubes = 4

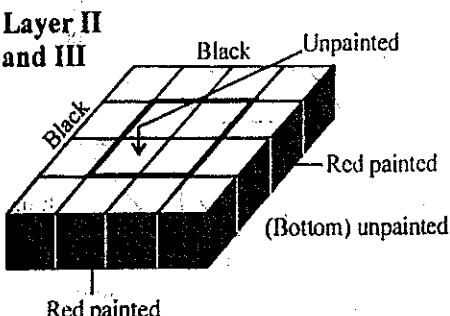


Now, the figure may be analysed by dividing it into four horizontal layers :

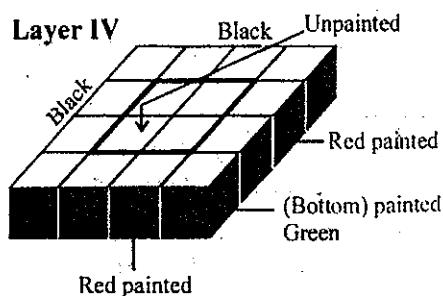
**In Layer I :** Four central cubes have only one face painted green, four cubes at the corners have three faces painted red, green and black. Out of the remaining 8 cubes, four cubes have two faces painted red and green and four cubes have two faces painted black and green.



**In Layer II and III :** Four central cubes have no faces painted, four cubes at the corners have two faces painted red and black. Out of the remaining 8 cubes four cubes have only one face painted black and four cubes have only one face painted red.



**In Layer IV :** Four central cubes have only one face painted green, four cubes at the corners have three faces painted red, green and black. Out of the remaining 8 cubes four cubes have two faces painted green and black and four cubes have two faces painted red and green.



13. (c) There are 8 cubes having no face painted.
14. (c) Cubes only one face painted

$$= 4 + 8 + 8 + 4 = 24$$

(I layer) (II layer) (III layer) (IV layer)

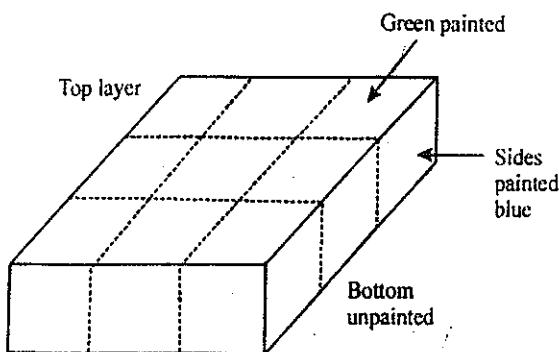
or  $(n-2)^2 \times 6 = 24$

15. (d) There are 24 cubes having only one face painted and 24 cubes having only two faces painted.
16. (b) Cubes with three faces painted = 8
17. (b) Cubes with one face green and one of the adjacent faces black or red = 8 (Top Layer) + 8 (Bottom Layer) = 16.

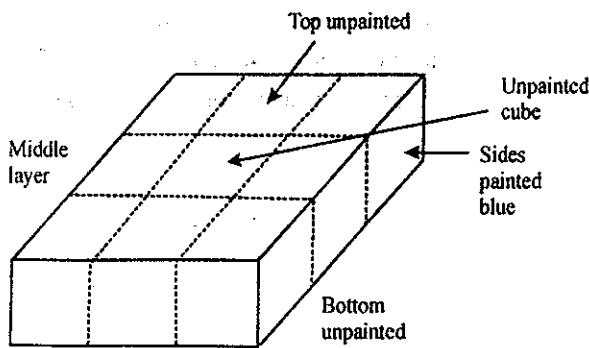
18-20.

The figure may be analysed by dividing it into three horizontal layers :

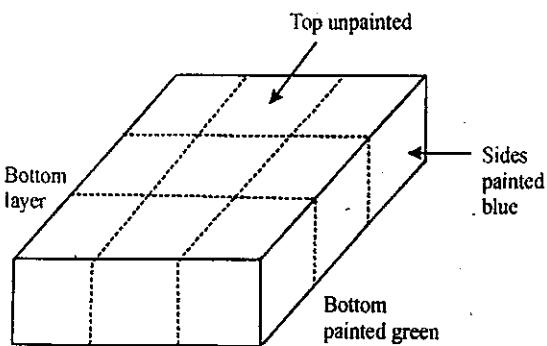
In the top layer, the central cube has only one face painted green, the four cubes at the corner have three face painted one face green and two faces blue. The remaining four cubes have two faces painted one green and one blue.



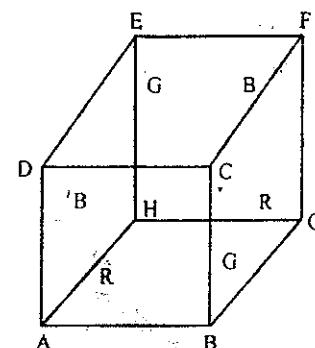
In the middle layer, the central cube has no face painted, four cubes at the corners have two faces painted blue and the remaining four cubes have one face painted blue.



In the bottom layer, the central cube has one face painted green and four cubes at the corners have three faces painted two blue and one green. The remaining four cubes have two faces painted—one blue and one green.



21-23.



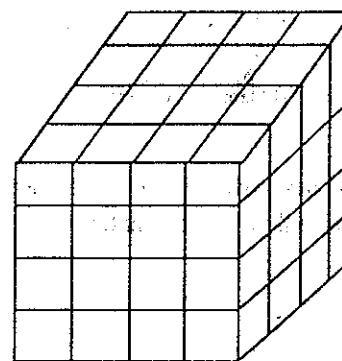
Here,

Faces ABCD, BCFG are painted with red.

Faces ADEH, EFGH are painted with red.

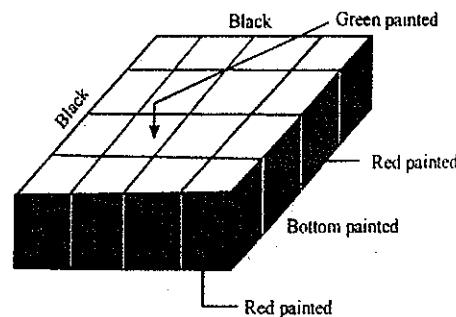
Faces CDEF, ABGH are painted with green.

No. of divisions on the faces of cubes = 4

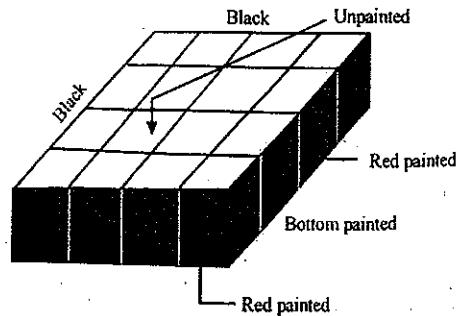


Now, the figure may be analysed by dividing it into four horizontal layers :

In Layer I : Four central cubes only one face painted green, four cubes at the corners have three faces painted red, green and black. Out of the remaining 8 cubes, four cubes have two faces painted red and green and four cubes have two faces painted black and green.

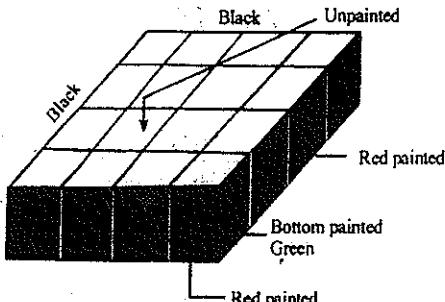


In layer II and III : Four central cubes have no faces painted, four cubes at the corners have two faces painted red and black. Out of the remaining 8 cubes four cubes have only one face painted black and four cubes have only one face painted red.



18. (d) There are four cubes in the middle layer which have one face painted only in blue.
19. (b) There is one (central) cube in the top layer and one (central) cube in the bottom layer which have one face painted only in green.
20. (c) There are 9 cubes in each of the three layers. Thus there are 27 cubes in all.

In layer IV : Four central cubes have only one face painted green, four cubes at the corners have three faces painted red, green and black. Out of the remaining 8 cubes four cubes have two faces painted green and black and four cubes have two faces painted red and green.



21. (c) There are 8 cubes having no face painted.  
22. (c) Cubes only one face painted

$$= 4 + 8 + 8 + 4 = 24$$

(I layer) (II layer) (III layer) (IV layer)

or  $(n-2)^2 \times 6 = 24$

23. (d) There are 24 cubes having only one face painted and 24 cubes having only two face painted.

24. (c) A  $10 \times 10 \times 10$  cube has 10 cubes of  $1 \times 1 \times 1$  cubes along its length, breadth and width each. If we remove a layer of  $1 \times 1 \times 1$  cubes (the smaller cubes) then the new cube will have following dimensions :

length =  $10 - 1 - 1 = 8$ ; breadth =  $10 - 1 - 1 = 8$  and  
width =  $10 - 1 - 1 = 8$ ,

So the number of  $1 \times 1 \times 1$  cubes in this  $8 \times 8 \times 8$  cube  
 $= 8 \times 8 \times 8 = 512$ .

25. (b) A  $5 \times 5 \times 5$  cube has 5 cubes of  $1 \times 1 \times 1$  cubes along its length, breadth and width each. If we add a layer of  $1 \times 1 \times 1$  cubes (the smaller cubes) then the new cube will have following dimensions :

length =  $5 + 1 + 1 = 7$ ; breadth =  $5 + 1 + 1 = 7$  and  
width =  $5 + 1 + 1 = 7$ .

So the number of  $1 \times 1 \times 1$  cubes in this  $7 \times 7 \times 7$  cube  
 $= 7 \times 7 \times 7 = 343$ .

26. (c) Clearly, in the figure there are --1 column containing 3 cubes, 2 columns containing 2 cubes each and 3 columns containing 1 cube each.  
Number of cubes in columns of 3 cubes =  $1 \times 3 = 3$ ;  
Number of cubes in columns of 2 cubes =  $2 \times 2 = 4$ ;  
Number of cubes in columns of 1 cubes =  $3 \times 1 = 3$ ;  
Therefore, total number of cubes =  $3 + 4 + 3 = 10$ .

OOO

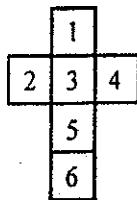
# 13

CHAPTER

## DICE

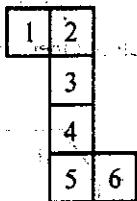
A dice is a cube with all of its faces numbered from 1 to 6.  
When a dice is unfolded, it will look like in any of the following forms:

**Form 1:**



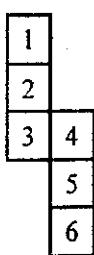
Number 1 is opposite to 5.  
Number 2 is opposite to 4.  
Number 3 is opposite to 6.

**Form 2:**



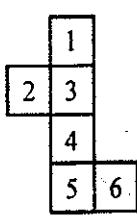
Number 1 is opposite to 6.  
Number 2 is opposite to 4.  
Number 3 is opposite to 5.

**Form 3:**



Number 1 is opposite to 3.  
Number 2 is opposite to 5.  
Number 4 is opposite to 6.

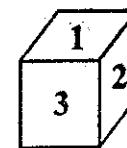
**Form 4:**



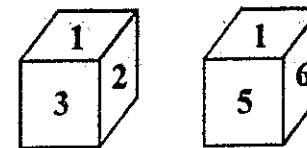
Number 1 is opposite to 4.  
Number 2 is opposite to 6.  
Number 3 is opposite to 5.

**Example 1 :**

Two positions of a dice are shown, when 4 is at the bottom, what number will be on the top?



(i)



(ii)

(a) 1      (b) 2      (c) 5      (d) 6

**Solution :**

- (a) From the two figures it is clear that the numbers 2, 3, 5 and 6 cannot appear opposite 1. So, 4 appears opposite 1. Therefore, when 4 is at the bottom, 1 will be on the top.

**Example 2 :**

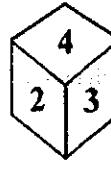
What should be the number opposite 3?



(i)



(ii)



(iii)

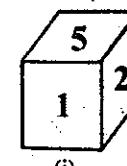
(a) 1      (b) 6      (c) 5      (d) 4

**Solution :**

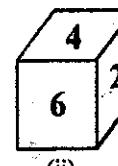
- (b) From the three given figures, it is clear that the 1, 2, 5 and 4 appear adjacent to 3, so none of these can appear opposite 3. Therefore, 6 appears opposite 3.

**Example 3 :**

Two positions of a dice are shown :



(i)



(ii)

- (i) Which number will come opposite to number 2?

(a) 5      (b) 1      (c) 6      (d) 3

- (ii) Which number will come opposite to number 6?

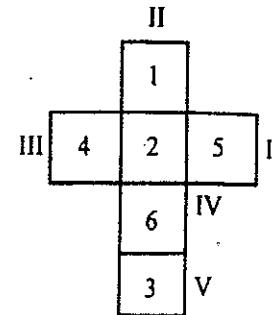
(a) 1      (b) 5      (c) 4      (d) 3

(iii) Which number will come opposite to number 4?

- (a) 3      (b) 5      (c) 1      (d) 2

**Solution :**

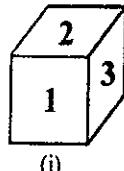
(i) (d) Here, common number to both the dice is placed in the central block. Now numbers to the anticlock wise directions of number 2 in each dice have been written in block I and II, III and IV respectively. Remaining number i.e. 3 will come in the block V. Hence number 3 will be opposite to number 2, number 1 will be opposite to number 6 and number 4 will be opposite to number 5.



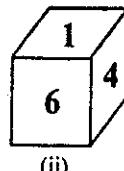
- (ii) (a)  
(iii) (b)

## EXERCISE

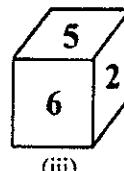
**DIRECTIONS (Qs. 1 - 5) :** Following questions are based on the figures given below which represent different positions of the same dice.



(i)



(ii)



(iii)

1. Which number lies at the bottom face of the dice (i)?

- (a) 4      (b) 2  
(c) 1      (d) 3

2. Which number lies at the bottom face of the dice (iii)?

- (a) 1      (b) 2  
(c) 6      (d) 4

3. Which number lies opposite 6?

- (a) 2      (b) 5  
(c) 3      (d) 1

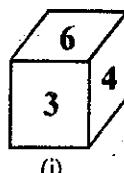
4. Which of the following combinations shows the numbers at the adjacent surfaces of the number 4?

- (a) 3, 2      (b) 6, 2  
(c) 2, 3      (d) 6, 3

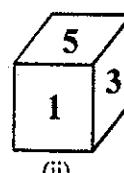
5. Which of the following numbers does not appear on any one of the adjacent surfaces of the number 3?

- (a) 2      (b) 6  
(c) 4      (d) 1

6. On the basis of two positions of dice, find what number will be on the opposite face of number 5?



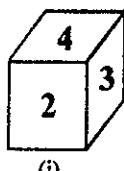
(i)



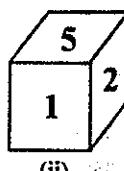
(ii)

- (a) 1      (b) 3  
(c) 4      (d) 5

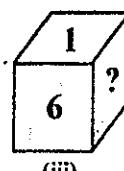
7. From the following positions of dice, find which number will come in place of '?'.



(i)



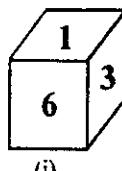
(ii)



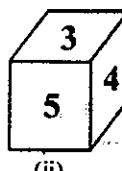
(iii)

- (a) 4      (b) 5      (c) 2      (d) 3

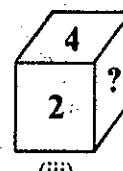
8. Three positions of the same dice are given below. Observe the figures carefully and find which number will come in place of '?'.



(i)



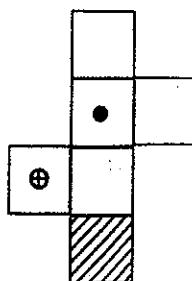
(ii)



(iii)

- (a) 1      (b) 6      (c) 3      (d) 5

9. Select from the alternative, the box that can be formed by folding the sheet shown in figure (X) :



(X)



- (A) A only  
(c) A, C and D only



- (B) A and C only  
(d) A, B, C and D

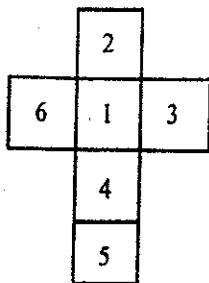




# SOLUTIONS

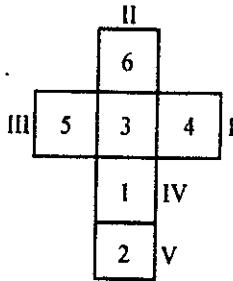
1. (a) Since 1, 3, 5 and 6 are adjacent to 2. Therefore, 4 lies opposite 2 i.e. at the bottom face of dice (i).
2. (a) Since 2, 3, 6 and 4 are adjacent to 1. Therefore, 5 lies opposite 1. Hence, 1 lies at the bottom face of dice (iii).
3. (c) Since 1, 4, 2 and 5 are adjacent to 6. Therefore, 3 lies opposite 6.

4. (d)

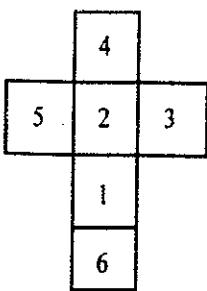


Hence, 1, 5, 3 and 6 are adjacent to 4.

5. (b) From the figure in previous solution, 6 is not adjacent to 3.
6. (c) Common number i.e. 3 to both the dice is placed on the central position of the figure. Now place the numbers in the anticlock wise direction in block I, II, III and IV respectively. Remaining number i.e. 2 will come in the block V. Hence number 4 is opposite to number 5.



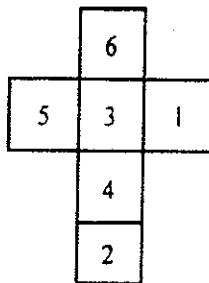
7. (d)



Hence, the numbers that are adjacent to 1 are 5, 2, 6 and 3.

$\therefore$  3 will come in place of '?'.

8. (a)



Since 2, 3, 5 and 1 are adjacent to 4. Therefore, 1 will come in place of '?'.

9. (a) When the sheet shown in fig. (X) is folded to form a cube, then the face bearing the dot lies opposite to the shaded face, the face bearing a circle (With '+' sign inside it) lies opposite to a blank face and the remaining two blank faces lie opposite to each other. Clearly, the cubes shown in figures (B) and (D) cannot be formed since they have the shaded face adjacent to the face bearing a dot and the cube shown in fig. (C) cannot be formed since it shows all the three blank face adjacent to each other. Hence, only the cube shown in fig.(A) can be formed.
10. (b) When the sheet in fig. (X) is folded to form a cube, then 'F' appears opposite 'C' and 'A' appears opposite 'D'. Therefore, the cube in fig. (A) which shows 'F' adjacent to 'B', the cube in fig.(C) which shows 'E' adjacent to 'C' and the cube in fig. (D) which shows 'A' adjacent to 'D' cannot be formed.
11. (c) From figure (i) (ii) and (iv), we conclude that 6, 4, 1 and 2 dots appear adjacent to 3 dots. Clearly, there will be 5 dots on the face opposite the face with 3 dots.
12. (c) When this figure is folded to form a cube then the face bearing three dots will lie opposite the face bearing five dots.
13. (d) From figures (i) and (iv) we conclude that 6, 5, 2 and 3 lie adjacent to 4. It follows that 4 lies opposite 4.
14. (a) The number of dots at the bottom faces of I, III and V dices are 8, 8 and 4 respectively.
15. (a) The number of dots at the top faces of II, IV and VI dices are 7, 7, and 5 respectively.
16. (a) The number of dots at the bottom faces of II, V and VI dices are 6, 4 and 8 respectively.



# 14

CHAPTER

## NUMBER PUZZLE

Chart logic problems present you with a partially filled in chart or table and ask you to fill it in completely given either the information in the chart, or some information given by the question.

**Example 1 :**

8		y
x		
4	9	2

In the figure above, each of the nine boxes must be filled by an integer from 1 to 9, so that each row and column is equal. No integer may be repeated. What is the value of  $x + y$ ?

**Solution :**

The bottom row is equal to 15. Since the question states that each row is of equal value

$$\begin{aligned} \therefore 8 + x + 4 &= 15 \\ x = 15 - 8 - 4 &\Rightarrow x = 3 \end{aligned}$$

The question also states that each box must be filled with a number from 1 and 9 and that each number can only be used once. The numbers 2, 3, 4, 8 and 9 have already been used, leaving you with 1, 5, 6, and 7 to fill in the remaining boxes. You should see immediately that the 7 can't go in the same row or diagonal with the 8, because that would add up to 15 for just two boxes in a row, and the entire row must add up to fifteen. Hence, 7 therefore must go here :

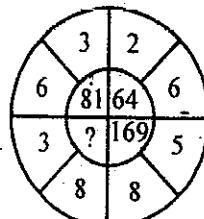
8		y
x		7
4	9	2

$$\therefore x = 3 \text{ and } y = 6$$

$$\text{Hence, value of } x + y = 3 + 6 = 9$$

**Example 2 :**

Find the missing character from among the given alternatives



(a) 121

(b) 61

(c) 74

(d) 101

**Solution :**

$$\begin{aligned} \text{(a)} \quad &\text{Here } (6+3)^2 = 9^2 = 81 \\ &(2+6)^2 = 8^2 = 64 \\ &(5+8)^2 = 13^2 = 169 \\ \therefore &(8+3)^2 = 11^2 = 121 \end{aligned}$$

**Example 3 :**

9	A	12
B	10	7
8	C	11

In the above matrix, what is the value of  $B - C$ ?

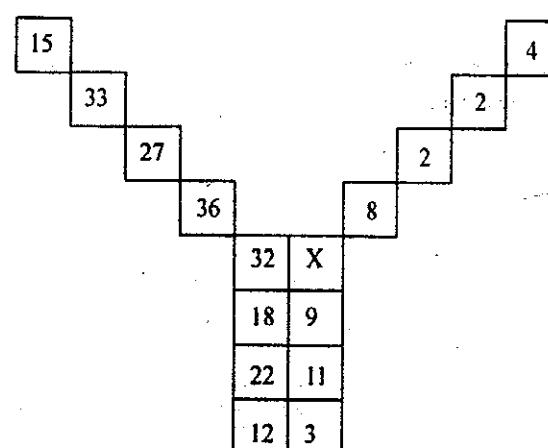
**Solution :**

Here, the sum of each row, each column and each diagonal is 30.

$$\begin{aligned} \therefore A &= 9, B = 13, C = 11 \\ \text{Hence } B - C &= 2. \end{aligned}$$

**Example 4 :**

Find the value of X in the following figure :



(a) 3

(b) 4

(c) 8

(d) 12

**Solution :**

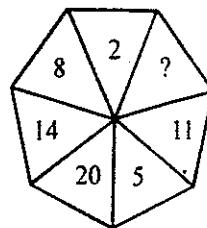
(b) The top left hand number is obtained by adding the bottom two numbers. The top right hand number is the result of dividing the bottom two numbers.

$$\text{Thus, } 12 + 3 = 15, 12 \div 3 = 4;$$

$$22 + 11 = 33, 22 \div 11 = 2.$$

$$18 + 9 = 27, 18 \div 9 = 2.$$

$$\text{So, } 32 + X = 36 \text{ and } 32 \div X = 8 \text{ or } X = 4.$$

**Example 5 :**

- (a) 18  
(c) 19

- (b) 17  
(d) 12

**Solution :**

(b) Start at 2 and, working clockwise, jump three spaces each time adding 3.

**EXERCISE**

1. The diagram below is a 'magic square' in which all rows and columns and both diagonals add up to 34. Find  $xy$

1	8	13	12
14			
4	x	16	y
15			

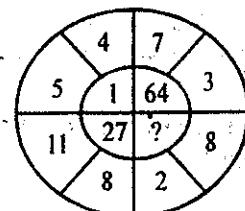
- (a) 77      (b) 60      (c) 45      (d) 63

5.

72	24	6
96	16	12
108	?	18

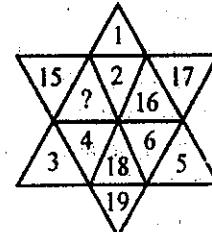
- (a) 12      (b) 16      (c) 18      (d) 20

6.



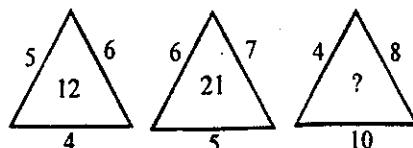
- (a) 0      (b) 8      (c) 128      (d) 216

7.



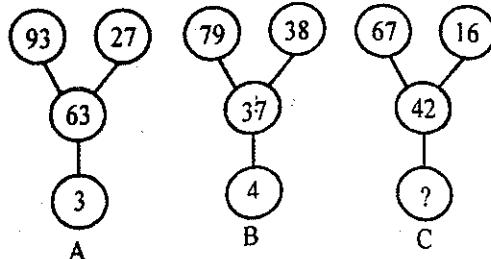
- (a) 13      (b) 14      (c) 20      (d) 21

8.



- (a) 14      (b) 22      (c) 32      (d) 320

9.



- (a) 5      (b) 6      (c) 8      (d) 9

2.

13	$4\frac{1}{4}$	
$6\frac{3}{4}$	A	B
8		$5\frac{1}{2}$

Complete above magic square so that the rows, columns, diagonals – all add to the same number and then find  $A + B$

- (a)  $20\frac{3}{4}$       (b) 20      (c)  $20\frac{1}{4}$       (d) None

**DIRECTIONS (Qs. 3 - 20) :** Find the missing character in each of the following questions.

3.

1	12	10
15	2	?
8	5	3

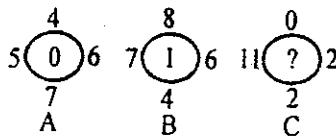
- (a) 9      (b) 11      (c) 4      (d) 6

4.

6	9	15
8	12	20
4	6	?

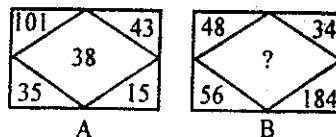
- (a) 5      (b) 10      (c) 15      (d) 21

10.



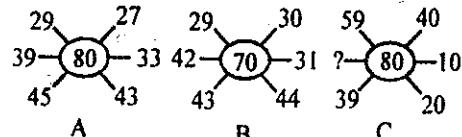
- (a) 0      (b) 2      (c) 11      (d) 12

11.



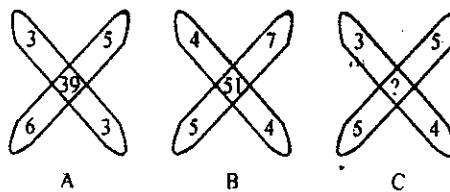
- (a) 127      (b) 142      (c) 158      (d) 198

12.



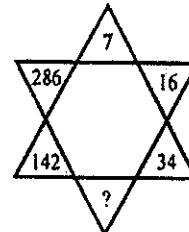
- (a) 49      (b) 50      (c) 60      (d) 69

18.



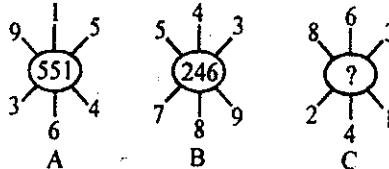
- (a) 47      (b) 45      (c) 37      (d) 35

19.



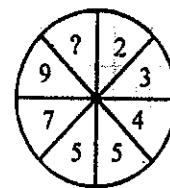
- (a) 72      (b) 70      (c) 68      (d) 66

13.



- (a) 262      (b) 622      (c) 631      (d) 824

20.



- (a) 10      (b) 11      (c) 12      (d) 13

14.

Z	?	S
R	O	?
?	G	C

- (a) WJK      (b) KWT      (c) WKJ      (d) JKW

21.

3C	2B	4A
27A	?	64B
9C	4A	16B

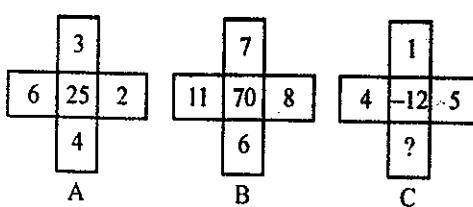
- (a) 8C      (b) 12B      (c) 16C      (d) 18C

15.

B	G	N
D	J	R
G	N	?

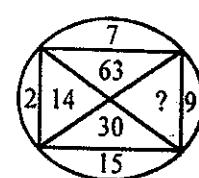
- (a) U      (b) V      (c) W      (d) X

22.



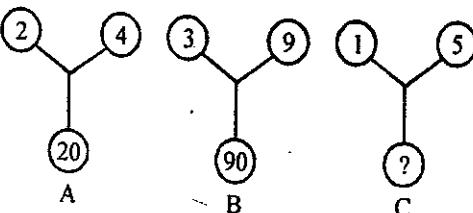
- (a) 10      (b) 6      (c) 2      (d) 1

23.



- (a) 33      (b) 145      (c) 135      (d) 18

24.



- (a) 75      (b) 26      (c) 25      (d) 20

16.

2	4	0
1	2	4
3	1	3
36	?	91

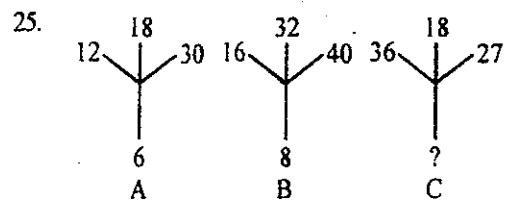
- (a) 24      (b) 48      (c) 59      (d) 73

17.

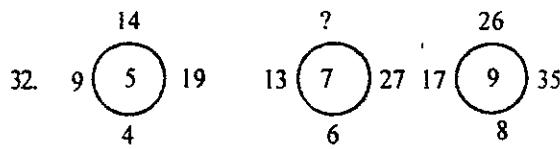
36	9	25
49	26	21
25	16	64

A      B      C

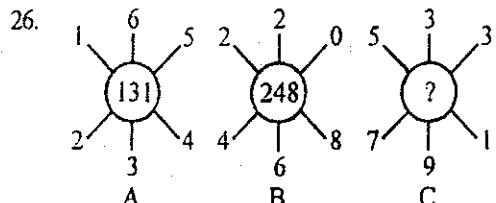
- (a) 19      (b) 23      (c) 25      (d) 31



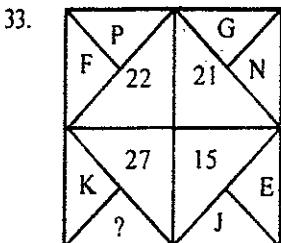
- (a) 18      (b) 12      (c) 9      (d) 6



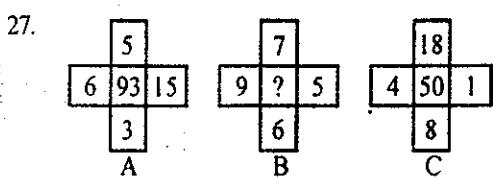
- (a) 18      (b) 20      (c) 22      (d) 24



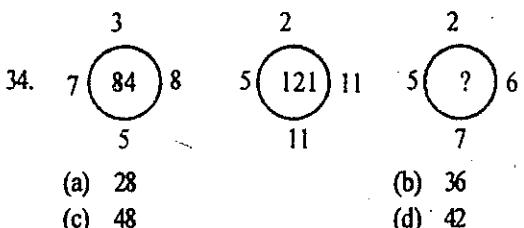
- (a) 320      (b) 274      (c) 262      (d) 132



- (a) M      (b) P  
(c) 32      (d) None of these



- (a) 5      (b) 19      (c) 27      (d) 89

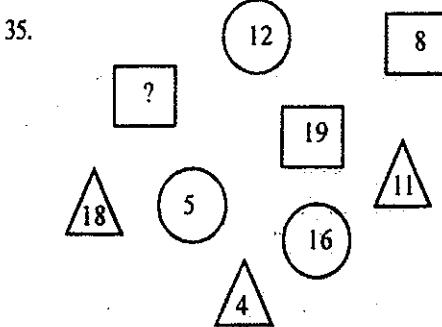


- (a) 28      (b) 36  
(c) 48      (d) 42

28.

4	5	6
2	3	7
1	8	3
21	98	?

- (a) 94      (b) 88      (c) 92      (d) 86



- (a) 6      (b) 8      (c) 10      (d) 12

29.

3C	27D	9E
71	21K	3M
4D	?	7J

- (a) 11E      (b) 28G      (c) 35L      (d) 48F

30.

5		
16	109	2
6		

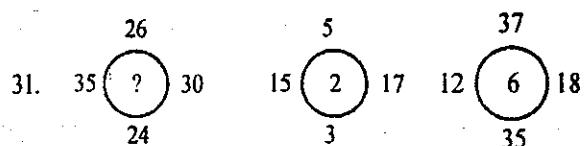
21		
22	53	19
15		

51		
17	?	48
13		

- (a) 7      (b) 25      (c) 49      (d) 129

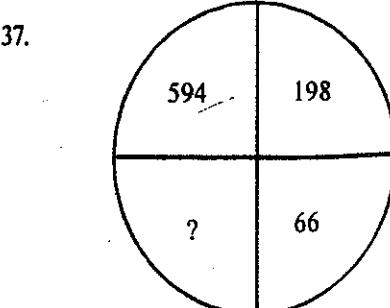
Find the missing number in the following sets of number around the circle from the choice given below :



- (a) 4      (b) 5      (c) 6      (d) 7

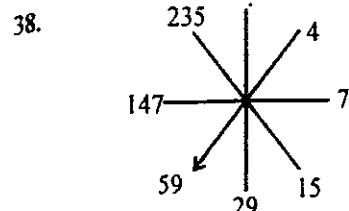


- (a) 12      (b) 25      (c) 48      (d) 52

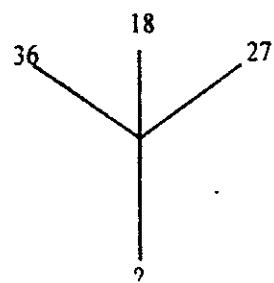


- (a) 11      (b) 12      (c) 22      (d) 33

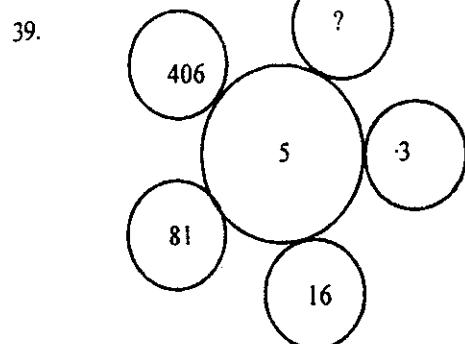
## NUMBER PUZZLE



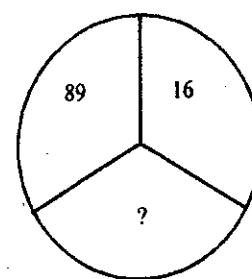
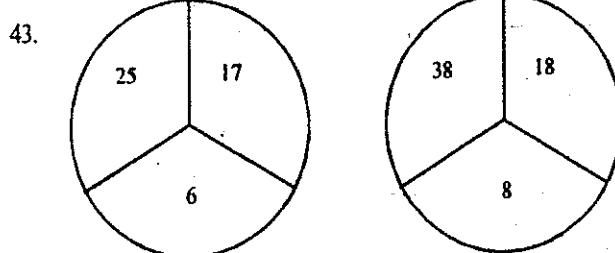
- (a) 327    (b) 386    (c) 438    (d) 469



- (a) 6    (b) 9    (c) 12    (d) 18



- (a) 1    (b) 731    (c) 1625    (d) 2031

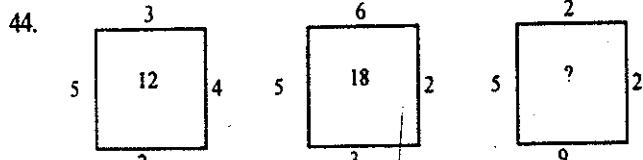


- (a) 13    (b) 15    (c) 17    (d) 19

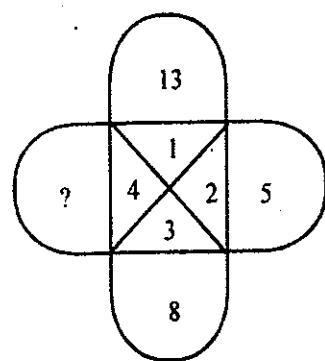
40.

3C	2B	4A
27A	?	64B
9C	4A	16B

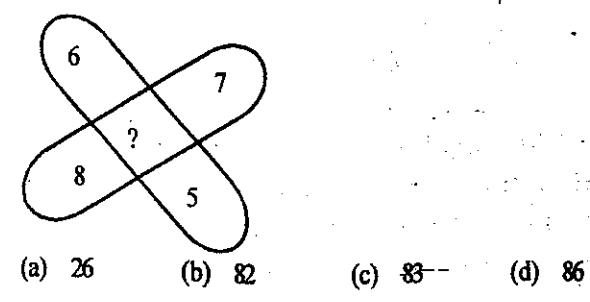
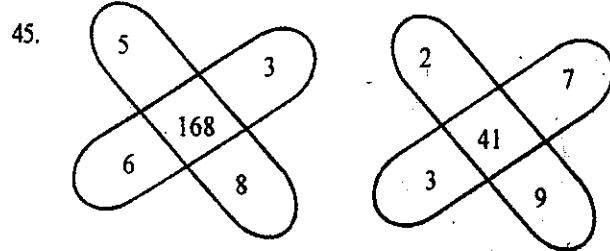
- (a) 8C    (b) 12 C    (c) 16C    (d) 18C



- (a) 15    (b) 16    (c) 17    (d) 18



- (a) 10    (b) 11    (c) 12    (d) 13



- (a) 26    (b) 82    (c) 83    (d) 86

46.

	36		
49	26	64	
25		18	21

- (a) 19      (b) 23      (c) 25      (d) 31

49.

6	6	8
5	7	5
4	3	?
120	126	320

47.

15		2	
	80		65
5		6	

9		7	
	65		
4		6	

- (a) 4      (b) 8      (c) 12      (d) 16

50.

3	6	8
5	8	4
4	7	?

- (a) 6      (b) 7      (c) 8      (d) 9

48.

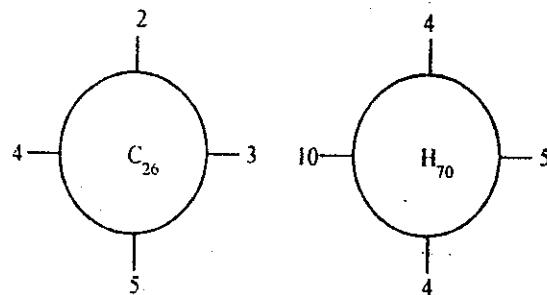
13		16	
	?		
11		8	

- (a) 35      (b) 48      (c) 72      (d) 120

51.

5	9	8	7
8	6	9	10
7	13	?	19
5	7	8	9

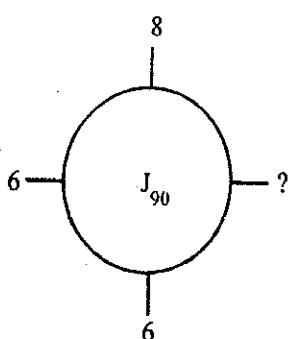
- (a) 9      (b) 10      (c) 12      (d) 15



52.

23	529	1024
21	441	144
19	361	?

- (a) 1441      (b) 3529      (c) 8281      (d) 9361



- (a) 1      (b) 2      (c) 4      (d) 10

53.

31	17	58	87
68	19	61	65
91	22	70	50
10	142	11	?

- (a) 5      (b) 8      (c) 7      (d) 4

54.

72	24	6
96	16	12
108	?	18

- (a) 12      (b) 16      (c) 18      (d) 20

DIRECTIONS (Q. 21 - 28) : In each of the following questions, a matrix of certain characters is given. These characters follows a certain trend, row-wise or column-wise. Find out this trend and choose the missing character from the given alternatives.

55. In the matrix given below, the value of A, B, and C are

9	A	12
B	10	7
8	C	11

- (a) A=13, B=11, C=9  
 (b) A=13, B=9, C=11  
 (c) A=9, B=11, C=13  
 (d) A=9, B=13, C=11

56.

188	300	263
893	?	915

- (a) 88      (b) 96      (c) 238      (d) 500

DIRECTION (Qs. 57 - 58) : In each of these question, which character when placed at the sign of interrogation shall complete the matrix ?

57.

F	W	O
A	J	K
E	M	?

- (a) N      (b) X      (c) D      (d) P

58.

A	M	B	N
R	C	S	D
E	U	F	?

- (a) G      (b) R      (c) T      (d) V

59.

There is some relationship according to some rule between the letters and numerals given in each row. Find the rule in each case and then choose the correct alternative from among the four alternatives given under it satisfying the same rule to fill in the vacant places in the third row.

FJ 25      16 NS

LZ 25      196 SX

NQ ?      ? WY

- (a) 4,9      (b) 9,4      (c) 4,10      (d) 9,5

## SOLUTIONS

1. (c)

1	8	13	12
14	11	2	7
4	5	16	9
15	10	3	6

2. (b)

13	$4\frac{1}{4}$	$10\frac{1}{2}$
$6\frac{3}{4}$	$9\frac{1}{4}$	$10\frac{3}{4}$
8	$14\frac{1}{4}$	$5\frac{1}{2}$

3. (c) This is a multiplication magic square. The product of each set of three numbers in any column or row is the constant 120.

4. (b) In the first row,  $6 \times \frac{3}{2} = 9$ ,  $6 \times \frac{5}{2} = 15$

$$\text{In the second row, } 8 \times \frac{3}{2} = 12, 8 \times \frac{5}{2} = 20.$$

∴ In the third row, missing number

$$= 4 \times \frac{5}{2} = 10$$

5. (a) In the first row,  $72 \div \left(\frac{24}{2}\right) = 72 \div 12 = 6$

$$\text{In the second row, } 96 \div \left(\frac{16}{2}\right) = 96 \div 8 = 12$$

Let the missing number in the third row be x. Then,

$$108 \div \left(\frac{x}{2}\right) = 18 \Rightarrow \frac{x}{2} = \frac{108}{18} = 6 \Rightarrow x = 12.$$

6. (d) Clearly,  $(5 - 4)^3 = 1$ ;

$$(7 - 3)^3 = 64; (11 - 8)^3 = 27.$$

$$\text{So, missing number} = (8 - 2)^3 = 6^3 = 216.$$

7. (b) The given figure contains numbers 1 to 6 in three alternate segments, the smaller number being towards the outside and the numbers 14 to 19 in the remaining three alternate segments with the smaller number towards the inside.

8. (c) The number inside the triangle is obtained by dividing the product of the numbers outside of the triangle by 10. Thus,

$$\text{In I triangle, } (5 \times 6 \times 4) \div 10 = 12$$

$$\text{In II triangle, } (6 \times 7 \times 5) \div 10 = 21$$

$$\therefore \text{In III triangle, missing number}$$

$$= (4 \times 8 \times 10) \div 10 = 32.$$

9. (d) In fig. (A),  $93 - (27 + 63) = 3$   
           In fig. (B),  $79 - (38 + 37) = 4$   
           ∴ In fig. (C), missing number  
 $= 67 - (16 + 42) = 9.$
10. (c) The number inside the circle is equal to the difference between the sum of the numbers at the extremities of the horizontal diameter and the sum of numbers at the extremities of the vertical diameter.  
       In fig. (A),  $(5 + 6) - (7 + 4) = 0$   
       In fig. (B),  $(7 + 6) - (8 + 4) = 1.$   
       ∴ In fig. (C) missing number  
 $= (11 + 2) - (0 + 2) = 11$
11. (b) In fig. (A),  
 $(101 + 15) - (35 + 43) = 116 - 78 = 38.$   
       In fig. (B), Missing number  
 $= (48 + 184) - (56 + 34) = 232 - 90 = 142.$
12. (d) The sum of numbers at the extremities of the three line segments in each figure is same.  
       In fig. (A),  $39 + 33 = 29 + 43 = 27 + 45 = 72$   
       In fig. (B),  $42 + 31 = 29 + 44 = 30 + 43 = 73$   
       Let the missing number in fig. (C) be x.  
       Then,  $x + 10 = 59 + 20 = 40 + 39 = 79$  or  $x = 69.$
13. (b) In fig. (A),  $(915 - 364) = 551.$   
       In fig. (B),  $(789 - 543) = 246.$   
       ∴ In fig. (C), missing number  
 $= (863 - 241) = 622.$
14. (c) The letter in the second column is three steps behind that in the first column, and the letter in the third column is four steps behind that in the second column. So, the missing letter in the first row will be three steps behind Z, which is W. The missing letter in the second row will be four steps behind O, which is K. The missing letter in the third row will be three steps ahead of G, which is J.
15. (c) The letters in the first row follow the sequence +5, +7.  
       The letters in the second row follow the sequence +6, +8.  
       In the third row, the first letter G moves 7 steps forward to give the second letter N. Clearly, the missing letter will be 9 steps ahead of N i.e. W.
16. (d) Clearly,  $(1\text{st row})^3 + (2\text{nd row})^3 + (3\text{rd row})^3 = 4\text{th row}$   
       So, in the first column,  
 $2^3 + 1^3 + 3^3 = 8 + 1 + 27 = 36$   
       In the third column,  
 $0^3 + 4^3 + 3^3 = 0 + 64 + 27 = 91$   
       ∴ In the second column, missing number  $= 4^3 + 2^3 + 1^3$   
 $= 64 + 8 + 1 = 73$
17. (d) In fig (A),  $6^2 = 36, 8^2 = 64, 5^2 = 25, 7^2 = 49$  and  $6 + 8 + 5 + 7 = 26$   
       In fig (B),  $3^2 = 9, 5^2 = 25, 4^2 = 16, 9^2 = 81$  and  $3 + 5 + 4 + 9 = 21$   
       In fig (C),  $5^2 = 25, 12^2 = 144, 6^2 = 36, 8^2 = 64.$   
       So, missing number  $= 5 + 12 + 6 + 8 = 31.$
18. (c) In fig (A),  $(3 \times 3) + (6 \times 5) = 39$   
       In fig (B),  $(4 \times 4) + (5 \times 7) = 51$   
       ∴ In fig (C), missing number  
 $= (3 \times 4) + (5 \times 5) = 37$
19. (b) Clearly, we have :  
 $7 \times 2 + 2 = 16; 16 \times 2 + 2 = 34$  and so on.  
       so missing number  $= 34 \times 2 + 2 = 70$
20. (b) The numbers in the right half form the series : 2, 3, 4, 5.  
       The numbers in the left half form the series : 5, 7, 9, 11.
21. (a) In each row, out of the letters A, B and C, each of these must appear once. Also, in each column, the product of first and third numbers is equal to the second number. So, the missing number will be  $(2 \times 4)$  i.e. 8 and the letter will be C. Thus, the answer is 8C.  
       Hence, the correct answer is (a).
22. (c) The arrangement is as follows :  
       In fig. (A),  $(3^2 + 6^2) - (2^2 + 4^2) = (9 + 36) - (4 + 16)$   
 $= 45 - 20 = 25$   
       In fig. (B),  $(7^2 + 11^2) - (8^2 + 6^2) = (49 + 121) - (64 + 36)$   
 $= 170 - 100 = 70$   
       In fig. (C), let the missing number be x.  
       Then,  $(1^2 + 4^2) - (5^2 + x^2) = -12$   
       or  $17 + 12 = (5^2 + x^2)$  or  $x^2 = 29 - 25 = 4$   
       or  $x = 2$
23. (c) Clearly, we have :  $15 \times 2 = 30, 2 \times 7 = 14,$   
 $7 \times 9 = 63$   
       So, missing number  $= 9 \times 15 = 135.$
24. (b) The lower number is obtained by adding the square of the upper two numbers. Thus,  
       In fig. (A),  $2^2 + 4^2 = 20$   
       In fig. (B),  $3^2 + 9^2 = 90$   
       ∴ In fig. (C), missing number  $= 1^2 + 5^2 = 26$
25. (c) The above three numbers are multiples of the number at the bottom.  
       Clearly, 36, 18 and 27 are all multiples of 9.  
       So, the missing number is 9.

26. (c) The digits of the number inside the circle are the differences between the corresponding numbers above and below the circle. Thus,  
 In fig. (A),  $1 = (2 - 1)$ ,  $3 = (6 - 3)$ ,  $1 = (5 - 4)$ .  
 In fig. (B),  $2 = (4 - 2)$ ,  $4 = (6 - 2)$ ,  $8 = (8 - 0)$   
 So, in fig. (C), the digits of the missing number are :  
 $(7 - 5)$ ,  $(9 - 3)$ ,  $(3 - 1)$  i.e. 2, 6, 2.  
 $\therefore$  Missing number = 262.
27. (d) In fig. (A),  $(6 \times 3) + (5 \times 15) = 18 + 75 = 93$ .  
 In fig. (C),  $(4 \times 8) + (18 \times 1) = 32 + 18 = 50$ .  
 $\therefore$  In fig. (B), missing number  
 $= (9 \times 6) + (7 \times 5) = 54 + 35 = 89$ .
28. (a) Clearly,  $(1\text{st row})^2 + (2\text{nd row})^2 + (3\text{rd row})^2 = 4\text{th row}$ .  
 Thus, in the first column,  $4^2 + 2^2 + 1^2 = 21$ .  
 In the second column,  $5^2 + 3^2 + 8^2 = 98$ .  
 $\therefore$  In the third column, missing number  
 $= 6^2 + 7^2 + 3^2 = 36 + 49 + 9 = 94$ .
29. (b) The letters in the first row form a series C, D, E (a series of consecutive letters). The letters in the second row form a series I, K, M (a series of alternate letters). Similarly, the letters in the third row will form the series D, G, J (a series in which each letter is three steps ahead of the previous one). So, the missing letter is G. Also, the number in the second column is equal to the product of the numbers in the first and third columns.  
 So, missing number is  $(4 \times 7)$  i.e. 28.  
 Thus, the answer is 28G.
30. (b) In fig. (A),  $(16 - 6)^2 + (5 - 2)^2 = 10^2 + 3^2 = 109$ .  
 In fig. (B),  $(22 - 15)^2 + (21 - 19)^2 = 7^2 + 2^2 = 53$ .  
 $\therefore$  In fig. (C), missing number  
 $= (17 - 13)^2 + (51 - 48)^2 = 4^2 + 3^2 = 25$ .
31. (b) The number inside the circle is the difference of the numbers on its left and right.
32. (b) The number at the centre is to be multiplied by 1, 2, 3, and 4, then subtract '1' from each to get the peripheral number.
33. (b) Putting A = 1, B = 2, C = 3, D = 4 .....  
 $X = 24$ ,  $Y = 25$ ,  $Z = 26$ ,  
 We have F + P = 6 + 16 = 22 : G + N  
 $= 7 + 14 = 21$   
 $\therefore J + E = 10 + 5 = 15$ .  
 Since K = 11, so value corresponding to missing letter  
 $= (27 - 11) = 16$   
 So, the missing letter is the 16th letter of the English alphabet, which is P.
34. (d) Multiply all the numbers around the circle and then divide it by 10 to get the number at the centre, viz.,  

$$\frac{7 \times 3 \times 8 \times 5}{10} = 84$$
35. (a) This way, the sum of the numbers in the same shape total 33.
36. (b) We have  $(56 + 15) - (22 + 8) = 41$ ,  $(46 + 9) - (10 + 6) = 39$   
 So, missing number =  $(34 + 11) - (14 + 6) = 25$ .
37. (c) Moving clockwise,  
 we have :  $594 \div 3 = 198$  :  $198 \div 3 = 66$ .  
 So, missing number =  $66 \div 3 = 22$
38. (d) We have :  $4 \times 2 - 1 = 7$ ,  $7 \times 2 + 1 = 15$ ,  
 $15 \times 2 - 1 = 29$ ,  $29 \times 2 + 1 = 59$ ,  
 $59 \times 2 - 1 = 117$ ,  $117 \times 2 + 1 = 235$ .  
 So missing number =  $235 \times 2 - 1 = 469$ .
39. (d) We have :  $3 \times 5 + 1 = 16$ ,  
 $16 \times 5 + 1 = 81$ ,  $81 \times 5 + 1 = 406$ .  
 So, missing number =  $406 = 406 \times 5 + 1 = 2031$ .
40. (a) In each row, out of the letters A, B and C, each of these must appear one. Also, in each column. The product of first and third numbers is equal to the second numbers so, the missing number will be  $(2 \times 4)$  i.e., 8 and the missing letter will be C. Thus, the answer is 8C.
41. (c) The arrangement is :  $5 + 3 = 8$ ,  $8 + 4 = 12$ ,  $12 + 1 = 13$ .  
 So, the missing number is 12.
42. (b) The above three numbers are multiples of the number at the bottom. Clearly 36, 18 and 27 are all multiples of 9. So, the missing number is 9.
43. (b) The sum of the two numbers in the upper part is 7 times the number in the lower part.  
 So, missing number =  $(89 + 16) + 7 = 15$ .
44. (d) We have :  $(3 \times 4 \times 2 \times 5) \div 10 = 12$  ;  
 $(6 \times 2 \times 3 \times 5) \div 10 = 18$ .  
 So, missing number =  $(2 \times 2 \times 9 \times 5) \div 10 = 18$
45. (b) We have :  $(5 \times 3) + (6 \times 8) = 63$ ,  $(2 \times 7) + (3 \times 9) = 41$   
 So, missing number =  $(6 \times 7) + (8 \times 5) = (42 + 40) = 82$ .
46. (d) We have :  $\sqrt{36} + \sqrt{64} + \sqrt{25} + \sqrt{49} = 26$  ;  
 $\sqrt{9} + \sqrt{25} + \sqrt{16} + \sqrt{81} = 21$   
 So, missing number  
 $= \sqrt{25} + \sqrt{144} + \sqrt{36} + \sqrt{64} = (5 + 12 + 6 + 8) = 31$
47. (b) We have  $(15 - 5)(2 + 6) = 80$ ,  $(9 - 4)(7 + 6) = 65$   
 So, missing number =  $(13 - 11)(16 + 8) = 48$ .

48. (c) The number inside the circle is obtained by multiplying the sum of the upper number, the lower number and the number corresponding to the position of the letter in the English alphabet, by the number on the right and then subtracting the number on the left from the product.

Thus we have  $(2 + C + 5) \times 3 - 4 = (2 + 3 + 5) \times 3 - 4 = 26$   
 $; (4 + H + 4) \times 5 - 10 = (4 + 8 + 4) \times 5 - 10 = 70$ .

Let the missing number be  $x$ .

$$\text{Then } (8 + J + 6) \times x - 6 = 90$$

$$\Rightarrow (8 + 10 + 6) \times x = 96 \Rightarrow x = 4.$$

49. (b) In the first column,  $6 \times 5 \times 4 = 120$ .

In the second column,  $6 \times 7 \times 3 = 126$

Let the missing number be  $x$ . Then in the third column,

$$\text{we have : } 8 \times 5 \times x = 320 \Rightarrow x = \frac{320}{40} = 8.$$

50. (a) Clearly, sum of numbers in each row is 17.

$$\text{So, missing number} = 17 - (4 + 7) = 6.$$

51. (d) In the first column,  $(5 + 8 + 7) \div 4 = 5$ .

$$\text{In the second column, } (9 + 6 + 13) \div 4 = 7.$$

$$\text{In the fourth column, } (7 + 10 + 19) \div 4 = 9.$$

Let the missing number be  $x$ . Then, in the third column, we have :  $(8 + 9 + x) \div 4 = 8 \Rightarrow 71 + x = 32 \Rightarrow x = 15$ .

52. (c) In each row, the second number is the square of the first number, and the third number is the square of the number obtained by interchanging the digits of the first number.

$$\therefore \text{Missing number} = (91)^2 = 8281.$$

53. (c) The sum of the numbers in each column is 200.

$$\therefore \text{Missing number} = 200 - (87 + 56 + 50) = 7.$$

54. (a) In the first row,  $72 \div \left(\frac{24}{2}\right) = 16$ .

$$\text{In the second row, } 96 \div \left(\frac{16}{2}\right) = 12.$$

Let the missing number in the third row be  $x$ .

$$\text{Then, } 108 \div \left(\frac{x}{2}\right) = 18 \Rightarrow \frac{x}{2} = \frac{108}{18} = 6 \Rightarrow x = 12$$

55. (d) The sum of the numbers in each row and each column is 30.

56. (a) In the first row,  $(263 - 188) \times 4 = 300$ .

$$\therefore \text{In the second row, missing number} = (915 - 893) \times 4 = 22 \times 4 = 88.$$

57. (c) Putting  $A = 1, B = 2, C = 3, \dots, M = 13, \dots, X = 24$ ,

$Y = 25, Z = 26$ , we have :

In the first column,  $F - A = 6 - 1 = 5 = E$ .

In the second column,  $W - J = 23 - 10 = 13 = M$ .

$$\therefore \text{In the third column, missing letter} = O - K = 15 - 11 = 4 = D.$$

58. (d) Consecutive letters occupy alternate positions in each row.

59. (a) We have :  $FJ = (F - J)^2 = (6 - 10)^2 = 16$ ;

$$NS = (N - S)^2 = (14 - 19)^2 = 25;$$

$$LZ = (L - Z)^2 = (12 - 26)^2 = 196;$$

$$SX = (S - X)^2 = (19 - 24)^2 = 25.$$

So, the missing numbers are :

$$(i) WY = (W - Y)^2 = (23 - 25)^2 = (-2)^2 = 4.$$

$$(ii) NQ = (N - Q)^2 = (14 - 17)^2 = (-3)^2 = 9.$$

OOO

# 15

CHAPTER

# MATHEMATICAL OPERATIONS

- In this type of questions, usual mathematical symbols (+, -, ×, <, > etc.) are represented by symbols, different from the usual ones. To solve this type of questions, substitute the real signs in the given expression and then solve the expression according to the rule BODMAS.

**Solution :**

- (d) Using the given symbols, we have :

$$\begin{aligned}\text{Given expression} &= 15 \div 3 + 24 - 12 \times 2 = 5 + 24 - 12 \times 2 \\ &= 5 + 24 - 24 = 5\end{aligned}$$

**Example 3 :**

If × stands for ‘addition’, < for ‘subtraction’, ÷ stands for ‘division’, > for ‘multiplication’, – stands for ‘equal to’, + for ‘greater than’ and = stands for ‘less than’, state which of the following is true?

- $3 \times 2 < 4 \div 16 > 2 + 4$
- $5 > 2 + 2 = 10 < 4 \times 8$
- $3 \times 4 > 2 - 9 + 3 < 3$
- $5 \times 3 < 7 \div 8 + 4 \times 1$

**Solution :**

- (b) Using the proper notations in (b), we get

$$5 \times 2 \div 2 < 10 - 4 + 8 \text{ or } 5 < 14, \text{ which is true.}$$

**Example 4 to 6 :**

In the following questions, the symbols ©, @, =, \* and \$ are used with the following meanings :

P © Q means ‘P is greater than Q’;

P @ Q means ‘P is greater than or equal to Q’;

P = Q means ‘P is equal to Q’;

P \* Q means ‘P is smaller than Q’;

P \$ Q means ‘P is either smaller than or equal to Q’.

Now in each of following questions, assuming the given statements to be true, find which of the two conclusions I and II given below them is/are definitely true.

Give answer :

- if only conclusion I is true;
- if only conclusion II is true;
- if either I or II is true;
- if neither I nor II is true.

## REMEMBER —

B	O	D	M	A	S
↓	↓	↓	↓	↓	↓

Brackets of division multiplication addition subtraction

**Example 1 :**

If + means ÷, × means –, ÷ means × and – means +, then  
 $8 + 6 \times 4 \div 3 - 4 = ?$

- |         |                     |
|---------|---------------------|
| (a) -12 | (b) $\frac{-20}{3}$ |
| (c) 12  | (d) $\frac{20}{3}$  |

**Solution :**

- (c) Using the given symbols, we have:

$$\text{Given expression} = 8 \div 6 - 4 \times 3 + 4 = \frac{4}{3} - 4 \times 3 + 4$$

$$= \frac{4}{3} - 12 + 4 = \frac{-20}{3}$$

**Example 2 :**

If A means –, B means ÷, C means + and D means ×, then  
 $15 B 3 C 24 A 12 D 2 = ?$

- |                      |                   |
|----------------------|-------------------|
| (a) 34               | (b) $\frac{5}{9}$ |
| (c) $-23\frac{4}{9}$ | (d) None of these |



10.  $a + b \div c$  implies

- (a)  $b - c - a$       (b)  $c - b + a$   
 (c)  $c + b - a$       (d)  $c \times b \div a$

11.  $a \times b \div c$  implies that

- (a)  $a - b + c$       (b)  $c \times b \div a$   
 (c)  $a \square b \square c$       (d)  $b \div a \div c$

12.  $a + b + c$  does not imply

- (a)  $b - b + c$       (b)  $c - b - a$   
 (c)  $c - a + b$       (d)  $b - a - c$

13. If '20 - 10' means 200, '8 ÷ 4' means 12, '6 × 2' means 4 and '12 + 3' means 4, then

$$100 - 10 \times 1000 \div 1000 + 100 \times 10 = ?$$

- (a) 1090      (b) 0  
 (c) 1900      (d) 20

**DIRECTIONS (Qs. 14-18) :** Below are given some symbols indicating some relations given against them. Read these symbols carefully and then answer the questions given below. There are four options to each question of which only one is correct. Find the correct answer

- $\Delta$  = greater than ;      + = not greater than  
 $\Theta$  = equal to ;       $\phi$  = not equal to  
 $\times$  = less than,       $\square$  = not less than

14.  $a \times b \theta c$  implies that

- (a)  $a \square c \theta b$       (b)  $b \times a \square c$   
 (c)  $c \square b + a$       (d)  $a \phi b \square c$

15.  $a \square b \Delta c$  implies that

- (a)  $a + \square b \Delta c$       (b)  $a \times b - c$   
 (c)  $a \Delta b \times c$       (d)  $a + b \times c$

16.  $a \Delta b \Delta c$  does not imply

- (a)  $b + a \Delta c$       (b)  $b \Delta a \theta c$   
 (c)  $c + b \phi a$       (d)  $c + b \times a$

17.  $a \times b \theta c$  does not mean

- (a)  $a \Delta b \phi c$       (b)  $a + b \theta c$   
 (c)  $a \phi b \theta c$       (d)  $b \theta c \square a$

18.  $c + b \times a$  means

- (a)  $a \times b \theta c$       (b)  $c \Delta b \Delta a$   
 (c)  $c \times b \times a$       (d)  $b \theta c \Delta a$

19. If + means  $\div$ , - means  $\times$ ,  $\div$  means + and  $\times$  means -, then  $36 \times 8 + 4 \div 6 + 2 - 3 = ?$ 

- (a) 2      (b) 18  
 (c) 43      (d)  $6\frac{1}{2}$

20. It being given that  $\triangleright$  denotes +,  $\triangleleft$  denotes -,  $\div$  denotes  $\times$ ,  $\times$  denotes  $\div$ ,  $=$  denotes  $=$ ,  $\square$  denotes 'less than' and  $\Delta$  denotes 'greater than', find which of the following is a correct statement:

- (a)  $3 + 2 \triangleright 4 = 9 + 3 \triangleleft 1$   
 (b)  $3 \triangleright 2 \triangleright 4 = 18 + 3 \triangleleft 2$   
 (c)  $3 \triangleright 2 \triangleleft 4 \times 8 + 4 \triangleleft 2$   
 (d)  $3 + 2 \triangleleft 4 \times 9 + 3 \triangleleft 3$

21. If L denotes  $x$ , M denotes  $\div$ , P denotes + and Q denotes $-$ , then  $8 P 36 M 6 Q 6 M 2 L 3 = ?$ 

- (a)  $\frac{13}{6}$       (b)  $-\frac{1}{6}$   
 (c)  $14\frac{1}{2}$       (d) 5

22. If X stands for 'addition',  $\triangleleft$  for 'subtraction', + stands for 'division',  $\triangleright$  for 'multiplication',  $\square$  stands for 'equal to',  $\div$  for 'greater than' and  $=$  stands for 'less than', state which of the following is true?

- (a)  $3 \times 2 \triangleleft 4 \div 16 \triangleright 2 + 4$   
 (b)  $5 \triangleright 2 + 2 = 10 \triangleleft 4 \times 2$   
 (c)  $3 \times 4 \triangleright 2 - 9 + 3 \triangleleft 3$   
 (d)  $5 \times 3 \triangleleft 7 \div 8 + 4 \times 1$

**DIRECTIONS : (Qs. 23-24) :** In each of the following question, different alphabets stand for various symbols as indicated below:

Addition : O      Subtraction : M

Multiplication : A      Division : Q

Equal to : X      Greater than : Y

Less than : Z

Out of the four alternatives given in these question, only one is correct.

23. (a) 1 O 1 Q 1 M 1 Y 3 Q 1

(b) 2 Q 1 O 2 A 1 Z 6 A 4

(c) 3 O 2 O 10 Q 2 X 10 A 2

(d) 5 Q 5 A 5 O 5 Y A 2

24. (a) 32 X 8 Q 2 A 3 Q 1 A 2

(b) 10 X 2 A 3 A 2 M 2 Q 1

(c) 2 Y 1 A 1 Q 1 O 1 A 1

(d) 16 Y 8 A 3 O 1 A 2 M 2

25. Find the correct inference according to given premises and symbols :

A : Not greater than      B : Greater than

C : Equal to      E : Not less than

F : Less than      Premise : (pCm) and (pAm)

(a) pAm      (b) pDm

(c) pEm      (d) pFm

**DIRECTIONS for Q. 26 :** In the question given below, use the following notations :

A''B means 'add B to A'.

A'B means 'subtract B from A',

A@B means 'divide A by B';

A \* B means 'multiply A by B';

Now, answer the following question.

26. The time taken two running trains in crossing each other is calculated by dividing the sum of the lengths of two trains by the total speed of the two trains. If the length of the first train is  $L_1$ , the length of the second train is  $L_2$ , the speed of the first train is  $V_1$  and the speed of the second train is  $V_2$ , which of the following expression would represent the time taken ?

- (a)  $(L_1 + L_2) * (V_1 + V_2)$
- (b)  $(L_1 + L_2) @ (V_1 + V_2)$
- (c)  $[(L_1 + L_2) @ (V_1 + V_2)] * 60$
- (d)  $(L_1 + L_2) @ (V_1 + V_2)$

27. If  $A + D > C + E$ ,  $C + D = 2B$  and  $B + E > C + D$ , it necessarily follows that

- (a)  $A + B > 2D$
- (b)  $B + D > C + E$
- (c)  $A + D > B + E$
- (d)  $A + D > B + C$

**DIRECTIONS (Qs. 28-31):** In the following question, the symbols,  $\odot$ ,  $\underline{\oplus}$ ,  $=$ ,  $*$  and  $\underline{*}$  are used with the following meanings

' $A \odot B$ ' means 'A is greater than B';  
' $A \underline{\oplus} B$ ' means 'A is greater than or equal to B';

' $A = B$ ' means 'A is equal to B';

' $A * B$ ' means 'A is smaller than B';

' $A \underline{*} B$ ' means 'A is either smaller than or equal to B';

Now in each of the following questions, assuming the given statements to be true, find which of the two conclusion I and II given below them is/are definitely true.

Give answer (a) if only if conclusion I is true; (b) if only conclusion II is true; (c) if either I or II is true; (d) if neither I nor II is true.

28. Statements :  $S \odot T$ ,  $M \underline{*} K$ ,  $T = K$

Conclusions : I.  $T \odot M$   
II.  $T = M$

29. Statements :  $S * M$ ,  $M \odot L$ ,  $L \underline{\oplus} P$

Conclusions : I.  $S = P$   
II.  $S \underline{*} L$

30. Statements :  $U = V$ ,  $V * N$ ,  $R \underline{*} U$

Conclusions : I.  $R * N$   
II.  $U \odot N$

31. Statements :  $E \odot U$ ,  $C * E$ ,  $C \odot B$

Conclusions : I.  $U = C$   
II.  $E \odot B$

32. If  $+$  means  $x$ ,  $-$  means  $\div$ ,  $\div$  means  $+$  and  $-$  means  $\times$ , then which of the following gives the result of

$$175 - 25 \div 5 \div 20 \times 3 + 10 ?$$

- (a) 77
- (b) 160
- (c) 240
- (d) 2370

33. If  $20 - 10$  means  $200$ ,  $8 \div 4$  means  $12$ ,  $6 \times 2$  means  $4$  then  $100 - 10 \times 1000 \div 1000 + 100 \times 10 = ?$

- (a) 0
- (b) 20
- (c) 1000
- (d) 1900

34. Which of the following conclusions is correct according to the given expression and symbols ?

A :  $>$       B :  $>$       C :  $\neq$

D :  $=$       E :  $\leq$       F :  $<$

Expression (qEq) and (qEr)

- (a) pFr
- (b) pFr
- (c) rBp
- (d) rBq

35. If '+' means 'divided by', '-' means 'added to', 'x' means 'subtracted from' and  $\div$  means 'multiplied by' then what is the value of  $24 + 12 - 18 \times 9 ?$

- (a) -25
- (b) 0.72
- (c) 15.30
- (d) 290

36. If  $x$  means  $+$ ,  $-$  means  $x$ ,  $\div$  means  $+$  and  $+$  means  $-$  then  $(3 - 15 \div 19) \times 8 + 6 = ?$

- (a) -1
- (b) 2
- (c) 4
- (d) 8

37. If  $+$  means  $+$ ,  $-$  means  $\div$ ,  $x$  means  $-$  and  $\times$  means  $x$  then

$$\frac{(36 \times 4) - 8 \times 4}{4 + 8 \times 2 + 16 + 1} = ?$$

- (a) 0
- (b) 8
- (c) 12
- (d) 16

38. If P means 'division', T means 'additions', M means 'subtraction' and D means multiplication then what will be the value of the expressions  $12 M 12 D 28 P 7 T 15 ?$

- (a) -30
- (b) -15
- (c) 15
- (d) -21

39. If A stands for  $+$ , B stands for  $-$ , C stands for  $x$ , then what is the value of  $(10 C 4) A (4 C 4) B 6 ?$

- (a) 60
- (b) 56
- (c) 50
- (d) 46

40. If  $\rightarrow$  stands for 'addition',  $\leftarrow$  stands for 'subtraction',  $\uparrow$  stands for 'division',  $\downarrow$  stands for 'multiplication',  $\nearrow$  stands for 'equal to' then which of the following alternatives is correct?

- (a)  $7 \leftarrow 43 \uparrow 6 \downarrow 1 \nearrow 4$
- (b)  $3 \downarrow 6 \uparrow 2 \rightarrow 3 \leftarrow 6 \nearrow 5$
- (c)  $5 \rightarrow 7 \leftarrow 3 \uparrow 2 \nearrow 5$
- (d)  $2 \downarrow 5 \leftarrow 6 \rightarrow 2 \nearrow 6$

41. Of 'x' stands for 'addition', 'z' for subtraction', '+' for division', ' $>$ ' for multiplication', '-' for 'equal to', '+' for 'greater than' and ' $\leq$ ' for 'less than' state which of the following is true. ?

- (a)  $3 \times 4 > 2 - 9 + 3 < 3$
- (b)  $5 \times 3 < 7 + 8 + 4 \times 1$
- (c)  $5 > 2 + 2 = 10 < 4 \times 8$
- (d)  $3 \times 2 < 4 \div 16 > 2 + 4$

42. If the given interchanges namely : signs + and  $\div$  and numbers 2 and 4 are made in signs and numbers, which one of the following four equations would be correct ?  
 (a)  $2+4\div 3=3$     (b)  $4+2\div 6=1.5$   
 (c)  $4\div 2+3=4$     (d)  $2+4\div 6=8$ .
43. It being given that  $x$  denotes ' greater than'  $\phi$  denote ' equal to'  $<$  denotes ' not less than'  $\perp$  denotes 'not equal to'  $\Delta$  denotes ' less than' and  $+$  denotes ' not greater than' choose the correct statement from the following  
 If  $a \times b \Delta c$ , it follows that  
 (a)  $a \phi \Delta b$     (b)  $b < a \times c$   
 (c)  $a < b + c$     (d)  $b < a \phi c$
- DIRECTIONS (Qs. 44-46) : In the following questions, the symbols @ C \$ % and # are used with the following meanings as illustrated below  
 'A \$ B' means 'A is not smaller than B'  
 'A # B' means 'A' is not smaller than B'  
 'A @ B' means 'A is neither smaller than nor equal to B'  
 'A C B' means 'A is neither greater than nor equal to B'  
 'A % B' means 'A' is neither greater than nor equal to B'  
 Now in each of the following questions, assuming the given statement to be true, find which of the three conclusions I, II and III given below then is / are definitely true and give your answer accordingly.  
 Clearly, we have  
 $A \$ B \Rightarrow A < B \Rightarrow A \geq B$   
 $A \# B \Rightarrow A \nless B \Rightarrow A \leq B$ .  
 $A @ B \Rightarrow A < B$  and  $A \# B \Rightarrow A > B$ ,  
 $A C B \Rightarrow A > B$  and  $A \# B \Rightarrow A < B$ .
44. Statements : H % J, J C N, N @ R  
 Conclusions : I, R % J    II, H @ J    III, N @ H  
 (a) Only I is true  
 (b) Only II is true  
 (c) Only II and III are true  
 (d) Only I and III are true
45. Statements : M @ J, J \$ T, T C N  
 Conclusion : I N # J    II. T % M    III. M @ N  
 (a) Only I and III are true  
 (b) Only II is true  
 (c) Only II and III are true  
 (d) I, II and III all are true
46. Statements : D C K, K # F, F @ P  
 Conclusions : I P @ D  
 (a) Only I and III are true  
 (b) Only II is true  
 (c) Only II and III are true  
 (d) Only III is true
47. If  $A + B = C + D$  and  $A + D > B + C$ , then which one of the following is definitely wrong?  
 (a)  $A > B$     (b)  $A < C$   
 (c)  $C > D$     (d)  $B > D$
48. Find the correct inference according to given premises and symbols.  
 (A) Not greater than    (B) Greater than  
 (C) Not equal to    (D) Equal to  
 (E) Not less than    (F) Less than  
 Premises : (I)  $Cm$  and (II)  $Am$   
 (a)  $Ibm$     (b)  $IDm$   
 (c)  $IEm$     (d)  $IFm$
49. If  $a \Delta b$  and  $b + c$ , then  
 (a)  $a \% c$     (b)  $c \% a$   
 (c)  $c + a$     (d) Can't say
50. If  $ac + bc$ , then  
 (a)  $a \square c$     (b)  $b \Delta c$   
 (c)  $c \Delta b$     (d)  $b \% a$
51. If  $B \theta 2C$  and  $3C \gamma A$ , then  
 (a)  $B \delta 2A$     (b)  $B \theta A$   
 (c)  $3B \alpha 2a$     (d)  $B \beta A$
52. If  $bcy \gamma ax$ ,  $cy \alpha bz$  and  $a^2 \gamma bc$ , then  
 (a)  $cx \alpha abz$     (b)  $cx \gamma abz$   
 (c)  $cx \delta abz$     (d)  $c^2 x ya^2 z$
53. If  $3 + 5 = 16$ ;  $7 + 9 = 64$ ;  $10 + 12 = 121$ , then  $11 + 3 = ?$   
 (a) 56    (b) 48  
 (c) 49    (d) 196
54. If  $36 \times 92 = 9623$ ;  $25 \times 82 = 8522$ ;  $68 \times 75 = 7856$ , then  $47 \times 52 = ?$   
 (a) 5742    (b) 5274  
 (c) 7427    (d) 5724
55. Which one of the four interchanges in signs and numbers would make the given equation correct ?  $3 + 5 - 2 = 0$   
 (a) + and -, 2 and 3    (b) + and -, 2 and 5  
 (c) + and -, 3 and 5    (d) None of these
56. If  $A + D = B + C$ ,  $A + E = C + D$ ,  $2C < A + E$  and  $2A > B + D$ , then  
 (a)  $A > B > C > D > E$     (b)  $B > A > D > C > E$   
 (c)  $D > B > C > A > E$     (d)  $B > C > D > E > A$
57. If  $A + B = 2C$  and  $C + D = 2A$ , then  
 (a)  $A + C = B + D$     (b)  $A + C = 2D$   
 (c)  $A + D = B + C$     (d)  $A + C = 2B$
58. The letters L, M, N, O, P, R, S and T in their order are substituted by nine integers 1 to 9 but not in that order. 4 is assigned to P. The difference between P and T is 5. The difference between N and T is 3. What is the integer assigned to N?  
 (a) 4    (b) 5  
 (c) 6    (d) 7

**DIRECTIONS (Q. 59-62) :** A goldsmith has five gold rings, each having a different weight. They are labelled as D, E, F, G and H. Their peculiarities are given in the following five statements :

Statement 1 : Ring D weighs twice as much as ring E.

Statement 2 : Ring E weighs four and a half times as much as ring F.

Statement 3 : Ring F weighs half as much as ring G.

Statement 4 : Ring G weighs half as much as ring H.

Statement 5 : Ring H weighs less than ring D but more than ring F.

59. If these rings are sold according to their weights, which ring will fetch the highest value in rupees?

- (a) D
- (b) G
- (c) F
- (d) H

60. Ring H is heavier to which of the following two rings ?

- (a) G and E
- (b) G and F
- (c) D and F
- (d) D and E

61. Which of the following is the lightest in weight?

- (a) D
- (b) E
- (c) F
- (d) G

62. Which of the following represents the descending order of the weights of the rings ?

- (a) D, E, H, G and F
- (b) F, D, G, E and H
- (c) H, F, G, D and E
- (d) E, G, H, D and F

## SOLUTIONS

1. (b) Using the given symbols, we have:

$$\begin{aligned}\text{Given expression} &= 8 + 7 \times 8 \div 40 - 2 = 8 + 7 \times \frac{1}{5} - 2 \\ &= 8 + \frac{7}{5} - 2 \\ &= \frac{37}{5} = 7\frac{2}{5}\end{aligned}$$

2. (d) Using the proper symbols, we have:

$$\begin{aligned}\text{Given expression} &= 16 + 24 \div 8 - 6 \div 2 \times 3 \\ &= 16 + 3 - 3 \times 3 = 16 + 3 - 9 = 10.\end{aligned}$$

3. (d) Using the proper notations in (d), we get

$$9 + 9 \div 9 - 9 \times 9 = 9 + 1 - 9 = 9 + 1 - 81 = -71.$$

∴ option (d) is true.

4. (d)  $40 + 12 \div 3 \times 6 - 60 = 4$

5. (c)  $9 \times 8 + 8 \div 4 - 9 = 65$

6. (c)  $24 \times 4 \div 8 + 4 = 24 \times \frac{1}{2} + 4 = 12 + 4 = 16$

7. (b)  $20 + 12 - 4 \div 8 \times 6 = 29$

8. (d) Using the proper notations in (d), we get

$$8 \times 8 + 8 \div 8 - 8 = 8 \times 8 + 1 - 8 = 64 + 1 - 8 = 57$$

9. (b)  $a - b - c$  means  $a < b < c$  and this relation implies that  $b > a < c$  i.e.  $b + a - c$ .

10. (c)  $a + b \div c$  means that  $a > b \nmid c$  and this relation implies that  $c > b < a$  i.e.  $c + b - a$ .

11. (b)  $a \times b \div c$  means  $a \nmid b \nmid c$  and this relation implies that  $c \nmid b \nmid a$  i.e.  $c \times b \div a$ .

12. (d)  $a + b + c$  means  $a > b > c$  and this relation does not imply that  $b < a < c$ , i.e.  $b - a - c$ .

13. (b) Since,  $20 \times 10 = 200$ , therefore,  $-$  means  $\times$

$$8 + 4 = 12, \text{ therefore, } \div \text{ means } +.$$

$$6 - 2 = 4, \text{ therefore, } \times \text{ means } -.$$

$$\text{and } 12 \div 3 = 4, \text{ therefore, } + \text{ means } \div.$$

Now, given expression

$$= 100 \times 10 - 1000 + 1000 \div 100 - 10$$

$$= 1000 - 1000 + 10 - 10 = 0$$

14. (d)  $a \times b \theta c$  is equivalent to  $a < b = c$ . Hence between a and b, we have  $a < b$  or  $a \neq b$  or  $a > b$

Further  $b = c$  implies that b and c are interchangeable. Hence (1), (2) and (3) are not possible.

[Observe that (2) states  $b < a$  which means  $a > b$  which is not possible. Similarly in (3)  $b > a$  which means  $a < b$  which contradicts the hypothesis.]

(d) Is the correct answer which states that  $a \neq b$  and  $b > c$ . Both statements are possible.

15. (a) Hypothesis (stem of the question) states  $a \neq b$  &  $b > c$ . Only relation not possible between a and b is that of equality. Hence (1), (2), (3), (4) are all possible from the relation between a and b.

Coming to the second relation only (1) is possible. Hence (1) is the answer.

16. (b) Note that in this question we have to determine which relation is not possible.

It is given that  $a > b > c$ .

Both relation in (1), (3) and (4) are possible. It is only (2) in which  $b = c$  is not true. Hence (2) is the answer.

[It should be noted that in case of negation of implication it is enough to show that just one relation is not possible.]

17. (a) With the situations given,

$a \times b \theta c$  mean  $a < b = c$

From option (1),  $a \Delta b \phi c$  means  $a > b \neq c$ , this is not true.

From option (2),  $a + b \theta c$  means  $a \leq b = c$ , this is true.

From option (3),  $a \phi b \theta c$  means  $a \neq b = c$ , this is true

From option (4),  $b \theta c \square a$  means  $b = c \geq a$ , this is true

So, the answer is (1).

18. (b) With the notations given,

$c + b \times a$  means  $c \leq b < a$

From option (1),  $a \times b \theta c$  means  $a < b = c$ , this is not true.

From option (2),  $c \Delta b \Delta a$  means  $a > b > c$ , this is true.  
 From option (3),  $c \times b \times a$  means  $a < b < c$ , this is not true.  
 From option (4),  $b @ c \Delta a$  means  $b = c > a$ , this is not true.

19. (c) Using the proper signs, we get:

$$\begin{aligned} 36 - 84 + 6 \div 2 \times 3 &= 36 - 2 + 3 \times 3 \\ &= 36 - 2 + 9 \\ &= 45 - 2 = 43 \end{aligned}$$

20. (c) Using proper notations, we have:

(1) given statement is  $3 \div 2 + 4 < 9 \div 3 - 1$  or  $\frac{11}{2} < 2$ ,

which is not true.

(2) given statement is  $3 + 2 + 4 < 18 \div 3 - 2$  or  $9 < 4$ , which is not true.

(3) given statement is  $3 + 2 - 4 > 8 \div 4 - 2$  or  $1 > 0$ , which is true.

(4) given statement is  $3 \div 2 - 4 > 9 \div 3 - 3$  or  $-\frac{5}{2} > 0$ ,

which is not true. So, the statement (c) is true.

21. (d) Using the correct symbols, we have:

$$\begin{aligned} \text{Given expression} &= 8 + 36 \div 6 - 6 \div 2 \times 3 \\ &= 8 + 6 - 3 \times 3 = 5 \end{aligned}$$

22. (b) Using the proper notations in (2), we get the statement as  $5 \times 2 \div 2 < 10 - 4 + 2$  or  $5 < 8$ , which is true.

23. (b) Using the proper notations (2), we get the statement as  $2 \div 1 + 20 \times 1 < 6 \times 4$  or  $22 < 24$ , which is true.

24. (b) Using the proper notations in (2), we get the statement as  $10 = 2 \times 3 \times 2 - 2 \div 1$  or  $10 = 10$ , which is true.

25. (c)  $pCm$  and  $pAm \Rightarrow p \neq m$  and  $p \ntriangleright m \Rightarrow p > m \Rightarrow pEm$ .

26. (b) Clearly, time taken =  $\frac{\text{sum of lengths of two trains}}{\text{total speed of two trains}}$

$$= \frac{L_1 + L_2}{V_1 + V_2} = (L_1 \text{ " } L_2) @ (V_1 \text{ " } V_2)$$

27. (d)  $A + D > C + E$

$$\Rightarrow A + D > (2B - D) + E (\because C + D = 2B)$$

$$\Rightarrow A + D > (B + E) + (B - D)$$

$$\Rightarrow A + D > (C + D) + (B - D)$$

$$\Rightarrow A + D > B + C.$$

28. (c) Given statements :  $S > T$ ,  $M \leq K$ ,  $T = K$

Relation between T and M

$$T = K, K \geq M \Rightarrow T \geq M \Rightarrow T > M \text{ or } T = M$$

$$\Rightarrow T @ M \text{ or } T = M$$

So, either I or II is true.

29. (d) Given statements :  $S < M$ ,  $M > L$ ,  $L \geq P$

I. Relation between S and P :

$$S < M, M > L, L \geq P \Rightarrow \text{no definite conclusion.}$$

So, I is not true.

## II. Relation between S and L :

$S < M, M > L \Rightarrow$  no definite conclusion.

So, II is also not true.

30. (a) Given statements :  $U = V$ ,  $V < N$ ,  $R \leq U$

## I. Relation between R and N

$$R \leq U, U = V, V < N \Rightarrow R < N \text{ i.e. } R * N$$

So, I is true.

## II. Relation between U and N :

$$U = V, V < N \Rightarrow U < N \text{ i.e. } U * N$$

So, U @ N i.e.  $U \geq N$  is not true.

Thus, II is false.

31. (b) Given statements  $E \geq U$ ,  $C < E$ ,  $C > B$

## I. Relation between U and C :

$$U \leq E, E > C \Rightarrow$$
 no definite conclusion.

So, I is not true.

## II. Relation between E and B :

$$E > C, C > B \Rightarrow E > B \text{ i.e. } E @ B$$

So, II is true.

32. (a) Using the proper signs in the given expression , we get

$$\begin{aligned} 175 \div 5 \times 20 - 3 \times 10 &= 7 + 5 \times 20 - 3 \times 10 = 7 + 100 - 30 \\ &= 107 - 30 = 77, \end{aligned}$$

33. (a) Given that :  $20 - 10 = 200$ .

But, actually  $20 \times 10 = 200$ , so - means  $\times$ .

Given that  $8 \div 4 = 12$ , But actually  $8 \div 4 = 12$ .

So, + means  $-$ .

Given that :  $6 \times 2 = 4$

But actually  $6 - 2 = 4$ . So,  $\times$  means  $-$

Thus, in the given mathematical language - means  $x$ ,

$-$  means + and  $x$  means  $-$  so,  $\div$  Given expression

$$= 100 \times 10 - 1000 + 1000 + 100 - 10$$

$$1000 - 1000 + 10 - 10 = 0.$$

34. (a)  $pEq$  and  $qFr \Rightarrow p \ntriangleleft q$  and  $q \ntriangleleft r \Rightarrow p \ntriangleleft r \Rightarrow pEr$

So, the answer is (1)

35. (d) Using the correct symbols, we have

$$\text{Given expression} = 24 \times 12 + 18 \div 9 = 288 + 2 = 290.$$

36. (b) Using the correct symbols, we have

$$\text{Given expression} = (3 \times 15 + 19) \div 8 - 6$$

$$= 64 \div 8 - 6 = 8 - 6 = 2.$$

37. (a) Using the correct symbols, we have

Given expression

$$= \frac{(36 - 4) + 8 - 4}{4 \times 8 - 2 \times 16 + 1} = \frac{32 + 8 - 4}{32 - 32 + 1} = \frac{4 - 4}{0 + 1} = 0.$$

38. (d) Using the correct symbols, we have

$$\text{Given expression} = 12 - 12 \times 28 \div 7 + 15$$

$$= 12 - 12 \times 4 + 15 = 12 - 48 + 15 = 27 - 48 = -21.$$

39. (c) Using the correct symbols, we have

$$\text{Given expression} = (10 \times 4) + (4 \times 4) - 6 = 40 + 16 - 6$$

$$= 56 - 6 = 50.$$

40. (d) Using the proper notations in (4) we get the statement as  $2 \times 5 - 6 + 2 = 6$  or  $10 - 6 + 2 = 6$  or  $6 = 6$ , which is true.
41. (c) Using the proper notations in (3), we get the statement as  $5 \times 2 + 2 < 10 - 4 + 8$  or  $5 \times 1 < 18 - 4$  or  $5 < 14$ , which is true.
42. (d) Interchanging (+ and ÷) and (2 and 4), we get :  
 (1)  $4 \div 2 + 3 = 3$  or  $5 = 3$ , which is false  
 (2)  $2 \div 4 + 6 = 1.5$  or  $6.5 = 1.5$ , which is false.  
 (3)  $2 + 4 \div 3 = 4$  or  $\frac{10}{3} = 4$ , which is false.  
 (4)  $4 \div 2 + 6 = 8$  or  $8 = 8$ , which is true.
43. (c) Using the usual notations, we have  
 (1) The statement is  $a > b < c \Rightarrow a = c < b$ , which is false  
 $[\because c > b]$   
 (2) The statement is  $a > b < c \Rightarrow b < a > c$ , which is false.  
 $[\because b < a]$   
 (3) The statement is  $a > b < c \Rightarrow a < b > c$ , which is true  
 (4) The statement is  $a > b < c \Rightarrow c < b < a$ , which is false.  
 $[\because b < a]$
44. (d) Given statements :  $H < J, J = N, N > R$ .  
 I. Relation between R and J  
 $R < N, N = J \Rightarrow R < N = J \Rightarrow R < J$  i.e.,  $R \% J$   
 II Relation between H and J :  $H < J$  i.e.,  $H \% J$ .  
 III. Relation between N and H.  
 $N = J, J > H \Rightarrow N = J > H \Rightarrow N > H$  i.e.,  $N @ H$ .  
 So, only I and III are true.
45. (d) Given statements :  $M > J, J \geq T, T = N$   
 I. Relation between T and M  
 $N = T, T \leq J \Rightarrow N = T \leq J \Rightarrow N > J$  i.e.,  $N @ J$ .  
 II Relation between T and M  
 $T \leq J, J < M \Rightarrow N = J < M \Rightarrow T < M$  i.e.,  $T \% M$   
 III Relation between M and N.  
 $M > J, J \geq T, T = N \Rightarrow M > J \geq T = N \Rightarrow M > N$  i.e.,  $M @ N$ .  
 Thus all I, II and III are true.
46. (d) Given statements :  $D = K, K \leq F, F > P$   
 I. Relation between P and D  
 $P < F, F \geq K, K = D \Rightarrow P < F, F \geq D \Rightarrow P < F \geq D \Rightarrow$  no definite conclusion.  
 II. Relation between K and P.  
 $K \leq F, F > P \Rightarrow K \leq F > P \Rightarrow$  no definite conclusion.  
 III. Relation between N and R.  
 $N = M, M \leq D \Rightarrow F \geq K = D \Rightarrow F \geq D$  i.e.,  $F \$ D$ .  
 Thus, only III is true. Hence the answer is (4)
47. (d) Given  $A + B = C + D$   
 $\Rightarrow A - D = C - B \quad \dots(1)$   
 and  $A + D > B + C \quad \dots(2)$   
 Subtracting (1) from (2) we get  $2D > 2B$  or  $D > B$ .  
 hence  $B > D$  is a wrong statement,
48. (d)  $|Cm$  and  $|Am \Rightarrow |# m$  and  $|> m \Rightarrow | < m \Rightarrow |fm$ .
49. (b)  $a \Delta b$  and  $b + c \Rightarrow a > b$  and  $b$  is a little more than  $c$   
 $\Rightarrow a > c \Rightarrow c < a$  i.e.,  $c \% a$ .
50. (d)  $ac + bc \Rightarrow ac > bc \Rightarrow a > b \Rightarrow b < a$  i.e.,  $b \% a$ .
51. (d)  $B \theta 2C$  and  $3C \gamma A \Rightarrow B = 2C$  and  $3C > A$   
 $\Rightarrow B = 2C$  and  $3C \leq A$   
 $\Rightarrow B = 2C < 3C \leq A \Rightarrow B < A$  i.e.,  $B \beta A$ .
52. (c)  $bcy \gamma ax, cy \alpha bz$  and  $\alpha^2 \gamma bc \Rightarrow bcy < ax, cy = bz$ ,  
 $\alpha^2 < bc$   
 $cy = bz \Rightarrow c^2y = bcz \Rightarrow c^2z > \alpha^2 z$   
 $ax > bcy > a^2y \Rightarrow ax > \alpha^2 y \Rightarrow x > \alpha y$   
 $\Rightarrow cx > acy \Rightarrow cx > abz$   
 $\Rightarrow cx \# abz$  i.e.,  $cx \delta abz$ .
53. (c) The rule is  $a + b = \left(\frac{a+b}{2}\right)^2$   
 $3 + 5 = \left(\frac{3+5}{2}\right)^2$  etc.  $\therefore 11 + 3 = \left(\frac{11+3}{2}\right)^2 = 49$
54. (d) The rule is the digits are jumbled in an order.
55. (a) By making the interchanges given in (1), we get the equation as  
 $2 - 5 + 3 = 0$  or  $0 = 0$  which is true.  
 By making the interchanges given in (2), we get the equation as  
 $3 - 2 + 5 = 0$  or  $6 = 0$ , which is false.  
 By making the interchanges given in (3), we get the equation as  
 $5 - 2 + 2 = 4$  or  $4 = 0$  which is not true.  
 So, the answer is (1).
56. (b)  $2C < A + E, A + E = C + D$   
 $\Rightarrow 2C < C + D \Rightarrow C < D \quad \dots(1)$   
 $A + D = B + C, C < D \Rightarrow A < B \quad \dots(2)$   
 $2A > B + D, A < B \Rightarrow A > D \quad \dots(3)$   
 $A + E = C + D, A > D \Rightarrow E < C \quad \dots(4)$
57. (1). Given :  $A + B = 2C \quad \dots(1)$   
 and  $C + D = 2A \quad \dots(2)$   
 Adding (1) and (2) we get :  
 $A + B + C + D = 2C + 2A \Rightarrow B + D = A + C$ .
58. (c)  $P = 4$   
 Difference between P and T = 5  
 Hence, T is assigned = 9  
 Difference between N and T = 3  
 Hence, N is assigned = 6
- 59-62 On the basis of information provided, we get the following relationship amongst the weights of the various rings.  
 $D = 2E, E = 4.5F$
- $F = \frac{G}{2}, G = \frac{H}{2}$   
 Let  $H = 10$ , then  $G = 5, F = 2.5$ ,  
 $E = 4.5 \times 2.5 = 11.25$  and  $D = 11.25 \times 2 = 22.50$   
 Thus the weights in the decreasing order are as follows  
 $D > E > H > G > F$ .
59. (a) As ring D is the heaviest, it will fetch the highest value.
60. (b) Clearly, H is heavier than G and F.
61. (c) Ring F is the lightest.
62. (a) As marked out above.

# 16

CHAPTER

## ARITHMETICAL REASONING

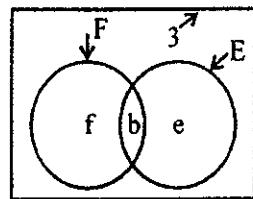
This chapter deals with arithmetical problems based on reasoning.

This type of questions are frequently asked in MBA and MCA competitive exams.

### Example 1 :

In a group of 15 people, 7 read French, 8 read English while 3 of them read none of these two. How many of them read French and English both?

### Solution :



Here, people who read French are denoted by F.

People who read English are denoted by E.

People who read only French are denoted by f.

People who read only English are denoted by e and people who read both French and English are denoted by b.

Then  $f + b + e + 3 = 15$  ..... (i)

$$f + b = 7 \quad \dots \dots \text{(ii)}$$

$$\text{and } e + b = 8 \quad \dots \dots \text{(iii)}$$

$$\text{Adding (ii) and (iii), we get } f + e + 2b = 15 \quad \dots \dots \text{(iv)}$$

$$\text{From (i) and (iv), we get } 12 + b = 15 \Rightarrow b = 3.$$

$\therefore$  Number of people, who read French and English both = 3.

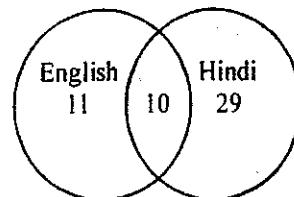
### Example 2 :

There are 50 students admitted to a nursery class. Some students can speak only English and some can speak only Hindi. Ten students can speak both English and Hindi. If the number of students who can speak English is 21, then how many students can speak Hindi and how many can speak only English ?

- (a) 39 and 11 respectively
- (b) 28 and 22 respectively
- (c) 37 and 13 respectively
- (d) 21 and 29 respectively

### Solution :

(a)



### Example 3 :

In a caravan in addition to 50 hens, there are 45 goats and 8 camels with some keepers. If the total number of feet be 224 more than the number of heads in the caravan, the number of keepers is

- (a) 5
- (b) 8
- (c) 10
- (d) 15

### Solution :

(d) Let number of keepers be x.

$$\begin{aligned} \text{Then, total number of feet} &= 2 \times 50 + 4 \times 45 + 4 \times 8 + 2x \\ &= 2x + 312. \end{aligned}$$

$$\text{Total number of heads} = 50 + 45 + 8 + x = 103 + x.$$

$$\text{Now, } (2x + 312) = (103 + x) + 224 \Rightarrow x = 15.$$

### Examples 4 :

Ravi's brother is 3 years senior to him. His father was 28 years of age when his sister was born while his mother was 26 years of age when he was born. If his sister was 4 years of age when his brother was born, what was the age of Ravi's father and mother respectively when his brother was born?

- (a) 32 years, 23 years (b) 32 years, 29 years
- (c) 35 years, 29 years (d) 35 years, 33 years

### Solution :

(a) When Ravi's brother was born,

let Ravi's father's age = x and mother's age = y. Then, sister's age = 4. Now,  $x - 28 = 4$  i.e.  $x = 32$ .

Ravi's age =  $y - 26$ .

Age of Ravi's brother =  $y - 26 + 3 = y - 23$ .

Now, when Ravi's brother was born, his age = 0.

i.e.,  $y - 23 = 0$  or  $y = 23$ .

**Examples 5 :**

**Directions :** Read the information given below to answer the questions that follow.

Monica started moving from point B towards point A exactly an hour after Puran started from A in the opposite direction but at a speed twice as much as that of Monica. By the time Puran covered one sixth of the distance between the points A and B, Monica also covered the same distance.

- (i) The point where Puran and Monica would meet is:

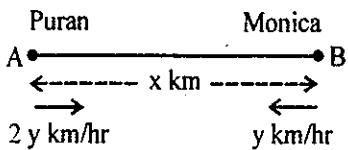
- (a) closer to A
- (b) exactly between A and B
- (c) closer to B
- (d) Monica and Puran will not meet at all

- (ii) How many hours would Puran take to reach B ?

- (a) 2
- (b) 5
- (c) 6
- (d) 12

- (iii) How many more hours would Monica take (compared to Puran) to complete the journey ?

- (a) 4
- (b) 5
- (c) 6
- (d) 7

**Solutions :**

Let the distance between the point A and B be  $x$  km and the speeds of Monica and Puran be  $2y$  km/hr and  $y$  km/hr,

respectively. Now, time taken by Puran to cover  $\frac{x}{6}$  km

$$= \frac{x/6}{2y} = \frac{x}{12y} \text{ hrs.}$$

Time taken by Monika to cover  $\frac{x}{6}$  km =  $\frac{x/6}{y}$

$$= \frac{x}{6y} \text{ hours}$$

$$\text{We have, } \frac{x}{6y} = \frac{x}{12y} + 1$$

$$\text{or } \frac{x}{y} \left[ \frac{1}{6} - \frac{1}{12} \right] = 1 \text{ or } x = 12y \quad \dots \text{(i)}$$

- (i) (c) Distance between Puran and Monika when distance

$$\text{covered by each of them is } \frac{x}{6} \text{ km}$$

$$= x - 2 \times \frac{x}{6} = \frac{2}{3}x = \frac{2}{3} \times 12y = 8y \text{ km}$$

$$\text{Their relative speed} = y + 2y = 3y \text{ km/hr}$$

$$\text{Time when they will meet} = \frac{8y}{3y} = \frac{8}{3} \text{ hr}$$

Distance travelled by Monika when both of them meet

$$= \frac{8}{3} \times y = \frac{8}{3}y = \frac{8}{3} \times \frac{x}{12} = \frac{2}{9}x \text{ km}$$

Total distance travelled by Monika before meeting.

$$\text{The Puran} = \frac{x}{6} + \frac{2}{9}x = \frac{7}{18}x \text{ km}$$

Therefore, their point of meeting is closer to B

- (ii) (c) Time taken by Puran to reach the point B =  $\frac{x}{2y}$

$$= \frac{12y}{2y} = 6 \text{ hours} \quad [\text{from (i)}]$$

- (iii) (c) Time taken by Monika to cover  $12y$  km

$$= \frac{12y}{y} = 12 \text{ hours}$$

Hence, Monika will take  $(12 - 6) = 6$  hours more as compared to Puran to complete the journey

**Example 6 :**

Thirty-six vehicles are parked in a parking in a single row. After the first car, there is one scooter. After the second car, there are two scooters. After the third car, there are three scooters and so on. Work out the number of scooters in the second half of the row.

- (a) 10
- (b) 12
- (c) 15
- (d) 17

**Solution :**

- (c) The arrangement in the parking

$$C + S + C + 2S + C + 3S + C + 4S + C + 5S + C + 6S + C + 7S + C = 36 \text{ vehicles}$$

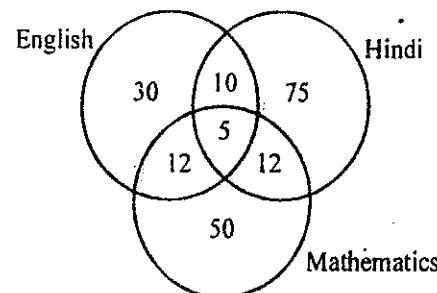
$\therefore$  in the second half of the row = 18 vehicles

$$\therefore C + 7S + C + 6S + C + 2S = 18 \text{ vehicles}$$

$$\text{Hence, no. of scooters} = 7 + 6 + 2 = 15$$

## EXERCISE

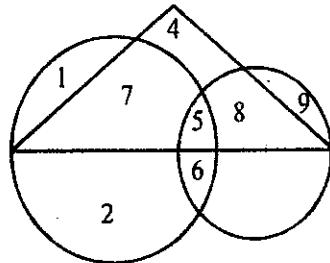
1. Reena is twice as old as Sunita. Three years ago, she was three times as old as Sunita. How old is Reena now?  
 (a) 6 years      (b) 7 years  
 (c) 8 years      (d) 12 years
2. A certain number of horses and an equal number of men are going somewhere. Half of the owners are on their horses' back while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there?  
 (a) 10      (b) 12  
 (c) 14      (d) 16
3. A is three times as old as B. C was twice as old as A four years ago. In four years' time, A will be 31. What is the present age of B and C?  
 (a) 9, 46      (b) 9, 50  
 (c) 10, 46      (d) 10, 50
4. In a town, 65% people watched the news on television, 40% read a newspaper and 25% read a newspaper and watched the news on television also. What per cent of the people neither watched the news on television nor read a newspaper?  
 (a) 5      (b) 10  
 (c) 15      (d) 20
5. First bunch of bananas has  $\frac{1}{4}$  again as many bananas as a second bunch. If the second bunch has 3 bananas less than the first bunch, then the number of bananas in the first bunch are  
 (a) 9      (b) 10  
 (c) 12      (d) 15
6. In a family, a couple has a son and a daughter. The age of the father is three times that of his daughter and the age of the son is half of his mother. The wife is 9 years younger to her husband and the brother is seven years older than his sister. What is the age of the mother?  
 (a) 40 years      (b) 45 years  
 (c) 50 years      (d) 60 years
7. In a group of persons travelling in a bus, 6 persons can speak Tamil, 15 can speak Hindi and 6 can speak Gujrati. In that group, none can speak any other language. If 2 persons in the group can speak two languages and one person can speak all the three languages, then how many persons are there in the group?  
 (a) 21      (b) 22  
 (c) 23      (d) 24
8. In a class, there are 18 boys who are over 160 cm tall. If these constitute three-fourths of the boys and the total number of boys is two-thirds of the total number of students in the class, what is the number of girls in the class?  
 (a) 6      (b) 12  
 (c) 18      (d) 24
9. Consider the diagram given below:



- Five hundred candidates appeared in an examination comprising of tests in English, Hindi and Mathematics. The diagram gives the number of candidates who failed in different tests. What is the percentage of candidates who failed in at least two subjects?
- (a) 0.078      (b) 1.0  
 (c) 6.8      (d) 7.8
10. A bus starts from city X. The number of women in the bus is half of the number of men. In city Y, 10 men leave the bus and five women enter. Now, number of men and women is equal. In the beginning, how many passengers entered the bus?  
 (a) 15      (b) 30  
 (c) 36      (d) 45
11. I have a few sweets to be distributed. If I keep 2, 3 or 4 in a pack, I have left one sweet. If I keep 5 in a pack, I have nothing left. What is the minimum number of sweets I can have to pack and distribute?  
 (a) 25      (b) 37  
 (c) 54      (d) 65
12. Out of a total of 120 musicians in a club, 5% can play all the three instruments—guitar, violin and flute. It so happens that the number of musicians who can play any two and only two of the above instruments is 30. The number of musicians who can play the guitar alone is 40. What is the total number of those who can play violin alone or flute alone?  
 (a) 30      (b) 38  
 (c) 44      (d) 45

13. Aruna cuts a cake into two halves and cuts one half into smaller pieces of equal size. Each of the small pieces is twenty grams in weight. If she has seven pieces of the cake in all with her, how heavy was the original cake?
- (a) 120 grams (b) 140 grams  
(c) 240 grams (d) 280 grams
14. A motorist knows four different routes from Bristol to Birmingham. From Birmingham to Sheffield he knows three different routes and from Sheffield to Carlisle he knows two different routes. How many routes does he know from Bristol to Carlisle?
- (a) 4 (b) 8  
(c) 12 (d) 24
15. At a farm, there are hens, cows and bullocks, and keepers to look after them. There are 69 heads less than legs; the number of cows is double of that of the bullocks; the number of cows and hens is the same and there is one keeper per ten birds and cattle. The total number of hens plus cows and bullocks and their keepers does not exceed 50. How many cows are there?
- (a) 10 (b) 12  
(c) 14 (d) 16
- DIRECTIONS (Qs. 16 to 24) :** Read the following information carefully to answer the questions that follow :
- A sample poll of 200 voters revealed the following information concerning three candidates A, B and C of a certain party who were running for three different offices :
- 28 in favour of both A and B.  
98 in favour of A or B but not C.  
42 in favour of B but not A or C.  
122 in favour of B or C but not A.  
64 in favour of C but not A or B.  
14 in favour of A and C but not B.
16. How many voters were in favour of all the three candidates?
- (a) 14 (b) 8  
(c) 20 (d) 16
17. How many voters were in favour of A irrespective of B or C?
- (a) 78 (b) 64  
(c) 42 (d) 56
18. How many voters were in favour of B irrespective of A or C?
- (a) 78 (b) 62  
(c) 48 (d) 86
19. How many voters were in favour of C irrespectively of A or B?
- (a) 78 (b) 102  
(c) 88 (d) 86
20. How many voters were in favour of A and B but not C ?
- (a) 8 (b) 20  
(c) 14 (d) 16
21. How many voters were in favour of only one of the candidates?
- (a) 58 (b) 78  
(c) 106 (d) 142
22. How many voters were in favour of A and C but not B ?
- (a) 22 (b) 78  
(c) 14 (d) 20
23. How many voters were in favour of C alone ?
- (a) 36 (b) 42  
(c) 64 (d) 38
24. How many voters were in favour of B and C but not A ?
- (a) 16 (b) 14  
(c) 42 (d) 64

**DIRECTIONS (Qs. 25 to 29) :** The following five questions are based on the following diagram in which, the triangle represents female graduates, small circle represents self-employed females and the big circle represents self-employed females with bank loan facility. Numbers are shown in the different sections of the diagram, which represent number of females lies in different sections. On the basis of these numbers, answer the questions :



25. How many female graduates are self-employed?
- (a) 12 (b) 13  
(c) 15 (d) 20
26. How many female graduates are not self-employed?
- (a) 4 (b) 10  
(c) 12 (d) 15
27. How many non-graduate females are self-employed?
- (a) 9 (b) 11  
(c) 12 (d) 21
28. How many self-employed female graduates are with bank loan facility?
- (a) 5 (b) 7  
(c) 12 (d) 20
29. How many non-graduate self-employed females are with bank loan facility?
- (a) 3 (b) 8  
(c) 9 (d) 12

**DIRECTIONS (Qs. 30-32) :** Seven poles A, B, C, D, E, F and G are put in such a way that the distance between the next two decreases by 1 metre. The distance between the first two poles, A and B, is 10 metres. Now answer the following questions.

30. If the authorities decide to remove one pole and place the remaining on equal distances among the poles, then each set of two poles would be ..... metres apart.

- (a)  $8\frac{1}{2}$
- (b)  $7\frac{1}{2}$
- (c) 9
- (d) None of these

31. If a monkey jumps from pole G to pole C, then how much distance did it cover?

- (a) 26 m
- (b) 19 m
- (c) 22 m
- (d) None of these

32. What is the distance between the first pole A and the last pole G?

- (a) 40 m
- (b) 49 m
- (c) 45 m
- (d) None of these

33. Standing on a rock, Ravi said that Madurai was more than 3 km but less than 8 km from there. Prabhu said that it was more than 6 km but less than 10 km from there. If both of them are correct, how far is Madurai from the rock?

- (a) 8 km
- (b) 6 km
- (c) 7 km
- (d) Cannot be determined

34. Keshav knows that Sudha's marks are more than 3 but less than 8 in a unit test. Sonia knows that these are more than 6 but less than 10. If both of them are correct, which of the following statements about Sudha's marks is definitely true?

- (a) It has only one value
- (b) It has any of three values
- (c) It has either of two values
- (d) It has any of four values

35. A party consists of grandmother, father, mother, four sons and their wives and one son and two daughters to each of the sons. How many females are there in all?

- (a) 14
- (b) 16
- (c) 18
- (d) 24

36. My bag can carry no more than ten books. I must carry at least one book each of management, mathematics, physics and fiction. Also, for every management book, I must carry two or more fiction books, and for every mathematics book, I must carry two or more physics books. I earn 4, 3, 2 and 1 points for each management, mathematics, physics and fiction book, respectively, I carry in my bag. I want to maximize the points I can earn by carrying the most appropriate combination of books in my bag. The maximum points that I can earn are

- (a) 21
- (b) 20
- (c) 22
- (d) 23

37. Eighty kilograms (kg) of store material is to be transported to a location 10 km away. Any number of couriers can be used to transport the material. The material can be packed in any number of units of 10, 20 or 40 kg. Courier charges are Rs. 10 per hour. Couriers travel at the speed of 10 km/hr if they are not carrying any load, at 5 km/hr if carrying 10 kg, at 2 km/hr if carrying 20 kg and at 1 km/hr if carrying 40 kg. A courier cannot carry more than 40 kg of load. The minimum cost at which 80 kg of store material can be transported to its destination will be

- (a) Rs. 160
- (b) Rs. 180
- (c) Rs. 140
- (d) Rs. 120

38. There is a ring road connecting points A, B, C, and D. The road is in a complete circular form but having several approach roads leading to the centre. Exactly in the centre of the ring road there is a tree which is 20 km from point A on the circular road. You have taken a round of circular road starting from point A and finish at the same point after touching points B, C and D. Then, you drive 20 km interior towards the tree from point A and from there, reach somewhere in between B and C on the ring road. How much distance do you have to travel from the tree to reach the point between B and C on the ring road?

- (a) 80 km
- (b) 15 km
- (c) 20 km
- (d) 40 km

39. A girl counted in the following way on the fingers of her left hand: she started by calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5 and then reversed direction calling the ring finger 6, middle finger 7 and so on. She counted upto 1994. She ended counting on which finger?

- (a) Middle finger
- (b) Index finger
- (c) Thumb
- (d) Ring finger

## SOLUTIONS

1. (d) Let Sunita's present age be  $x$  years. Then, Reena's present age =  $2x$  years

Three years ago, Sunita's age =  $(x - 3)$

and Reena's age =  $(2x - 3)$

So,  $2x - 3 = 3(x - 3)$  or  $2x - 3 = 3x - 9$  or  $x = 6$ ,

$\therefore$  Reena's present age =  $2x = 12$  years

2. (c) Let number of horses = number of men =  $x$

Then, number of legs =  $4x + 2 \times \frac{x}{2} = 5x$

So,  $5x = 70$  or  $x = 14$

3. (b) Clearly, we have:

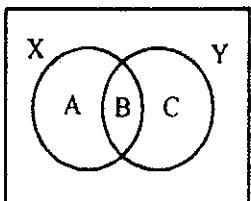
$$A = 3B \quad \dots(i) \quad C - 4 = 2(A - 4) \quad \dots(ii)$$

Also,  $A + 4 = 31$  or  $A = 31 - 4 = 27$

Putting  $A = 27$  in (i), we get,  $B = 9$

Putting  $A = 27$  in (ii), we get,  $C = 50$

4. (d) Let the total number of people be 100.



Let circle X represents people who watched television and Y represents people who read newspaper.

Then,  $A + B = 65$ ,  $B + C = 40$ ,  $B = 25$

Solving, we get  $A = 40$ ,  $B = 25$ ,  $C = 15$

$\therefore$  Number of persons who neither watched television nor read newspaper =  $100 - (A + B + C)$

$$= 100 - (40 + 25 + 15)$$

$$= 100 - 80 = 20.$$

So, required percentage = 20%

5. (d) Let the number of bananas in the second bunch be  $x$ .

Then, number of bananas in the first bunch =  $x + \frac{1}{4}x$

$$= \frac{5}{4}x.$$

$$\text{So, } \frac{5}{4}x - x = 3 \Rightarrow 5x - 4x = 12 \Rightarrow x = 12.$$

$$\therefore \text{Number of bananas in first bunch} = \left(\frac{5}{4} \times 12\right) = 15$$

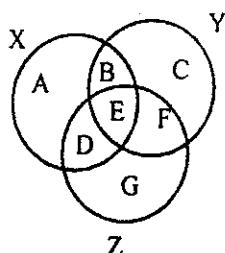
6. (d) Let the daughter's age be  $x$ . Then, father's age =  $3x$ .

Mother's age,  $3x - 9$ ; Son's age =  $x + 7$ .

$$\text{So, } x + 7 = \frac{3x - 9}{2} \text{ or } 2x + 14 = 3x - 9 \text{ or } x = 23$$

$\therefore$  Mother's age =  $3x - 9 = 69 - 9 = 60$  years.

7. (c) Let circles X, Y, and Z represent persons who can speak Tamil, Hindi and Gujarati respectively.



Then,

$$\text{Tamil-speaking persons} = A + B + D + E = 6 \quad \dots(i)$$

$$\text{Hindi-speaking persons} = B + C + E + F = 15 \quad \dots(ii)$$

$$\text{Gujarati-speaking persons} = D + E + F + G = 6 \quad \dots(iii)$$

$$\text{Persons speaking 2 languages} = B + D + F = 2 \quad \dots(iv)$$

$$\text{Persons speaking all 3 languages} = E = 1 \quad \dots(v)$$

$$\text{Hence, } A + B + D = 5 \quad \dots(vi)$$

$$B + C + F = 14 \quad \dots(vii)$$

$$D + F + G = 5 \quad \dots(viii)$$

$$\text{Subtracting (iv) from (vi), we get } A - F = 3 \quad \dots(ix)$$

Adding (vii) and (viii), we get

$$B + C + D + 2F + G = 19 \quad \dots(x)$$

Adding (ix) and (x), we get

$$A + B + C + D + F + G = 22$$

$$\Rightarrow A + B + C + D + E + F + G = 23. (\because E = 1)$$

$\therefore$  Total number of person = 23.

8. (b) Let the number of boys be  $x$ .

$$\text{Then, } \frac{3}{4}x = 18 \text{ or } x = 18 \times \frac{4}{3} = 24$$

$$\text{Let total number of students is } y, \text{ then } \frac{2}{3}y = 24$$

$$\text{or } y = 24 \times \frac{3}{2} = 36$$

$\therefore$  Number of girls in the class =  $36 - 24 = 12$

9. (d) Clearly, number of candidates who failed in at least two subjects = number of candidates who failed in two or more subjects  
 $= 10 + 12 + 12 + 5 = 39$

$$\text{Required percentage} = \left(\frac{39}{500} \times 100\right)\% = 7.8\%.$$

10. (d) Originally, let the number of women =  $x$ .

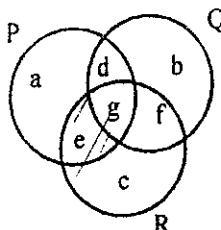
Then, number of men =  $2x$

$$\text{In city Y, } (2x - 10) = (x + 5) \text{ or } x = 15$$

$$\therefore \text{Total number of passengers in the beginning} \\ = (x + 2x) = 3x = 45$$

11. (a) Clearly, the required number would be such that it leaves remainder of 1 when divided by 2, 3 or 4 and no remainder when divided by 5. Such a minimum number is 25.

12. (c) Let circles P, Q and R represent the musicians who can play guitar, violin and flute respectively.



$$\text{Now, } a + b + c + d + e + f + g = 120$$

Number of musicians who can play all the three instruments =  $g = 5\% \text{ of } 120 = 6$

Number of musicians who can play any two and only two of the instruments =  $d + e + f = 30$

$$\begin{aligned} \text{Number of musicians who can play violin alone or flute only} &= b + c = 120 - (a + d + e + f + g) \\ &= 120 - (40 + 30 + 6) = 44 \end{aligned}$$

13. (c) The seven pieces consist of 6 smaller equal pieces and one half cake piece.

Weight of each small piece = 20gms

$$\text{So, total weight of the cake} = 2 \times (20 \times 6) = 240 \text{ gms}$$

14. (d) Total number of routes from Bristol to Carlisle  
 $= (4 \times 3 \times 2) = 24$

15. (b) Let the number of hens, cows, bullocks and keepers be represented by H, C, B and K respectively. Then,

$$\text{number of heads} = H + C + B + K$$

$$\text{number of legs} = 2H + 4C + 4B + 2K$$

$$\text{Given, } H + C + B + K + 69 = 2H + 4C + 4B + 2K$$

$$\Rightarrow H + C + B + K + 69 = 4(H + C + B) + 2K - 2H \dots(i)$$

$$\text{Also, } C = 2B \dots(ii)$$

$$C = H \dots(iii)$$

$$H + C + B = 10K \dots(iv)$$

$$H + C + B + K \leq 50 \dots(v)$$

Putting  $H + C + B = 10K$  in (iv), we get:

$$11K + 69 = 42K - 2H \text{ or } 31K - 2H = 69$$

$$\text{or } 2H = 31K - 69 \dots(vi)$$

Putting  $H + C + B = 10K$  in (v), we get  $11K \leq 50$

$$\Rightarrow K \leq 4.54$$

Thus,  $K = 1, 2, 3$  or  $4$

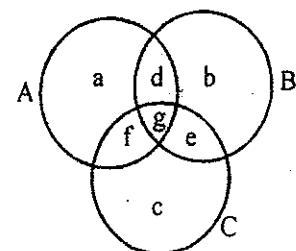
Putting  $K = 1$  or  $2$ , we get negative values of  $H$ , which is not possible.

Putting  $K = 4$ , we get fractional value of  $H$ , which is also not possible.

Putting  $K = 3$ , we get  $H = 12$ . So  $C = H = 12$ .

#### For Qs. 16 to 24 :

The given information can be depicted by Venn Diagram as follows:



Here,

$$g + d = 28 \dots(i)$$

$$a + d + b = 98 \dots(ii)$$

$$b = 42 \dots(iii)$$

$$b + c + e = 122 \dots(iv)$$

$$c = 64 \dots(v)$$

$$f = 14 \dots(vi)$$

$$a + b + c + d + e + f + g = 200 \dots(vii)$$

16. (b) Clearly 8 voters were in favour of all the three candidates.

Using (vii),

$$(a + d + b) + (c + e) + 14 + g = 200$$

$$\Rightarrow 98 + 122 - b + 14 + g = 200$$

$$\Rightarrow 234 - 42 + g = 200 \Rightarrow g = 8$$

$$\text{Using (iv), } 42 + 64 + e = 122 \Rightarrow e = 16$$

$$\text{Using (i), } g + d = 8 + d = 28 \Rightarrow d = 20$$

$$\text{Using (ii), } a + d + b = a + 20 + 42 = 98$$

$$\Rightarrow a = 36$$

17. (a) No. of voters favouring A irrespective of B or C  
 $= a + d + g + f = 36 + 20 + 8 + 14 = 78$

18. (d) No. of voters favouring B irrespective of A or C  
 $= b + d + e + g = 42 + 20 + 16 + 8 = 86$ .

19. (b) No. of voters favouring C irrespective of A or B  
 $= c + f + g + e = 64 + 14 + 8 + 16 = 102$

20. (b) The no. of voters favouring A and B but not C =  $d = 20$

21. (d) The total no. of voters favouring only one of the candidates =  $a + b + c = 36 + 42 + 64 = 142$ .

22. (c) No. of voters favouring A and C but not B =  $f = 14$ .

23. (c) No. of voters favouring C alone =  $c = 64$ .

24. (a) No. of voters favouring B and C but not A =  $e = 16$ .

25. (d) The region common to the triangle and any of the two or both the circles represents the number of self-employed female graduates. It is  $8 + 5 + 7 = 20$ .

26. (a) The region lying inside the triangle but outside both the circle represents the number of female graduates who are not self-employed. It is 4.

27. (d) The regions lying outside the triangle but inside any or both the circles represents the number of non-graduate, self-employed females. It is  $9 + 3 + 6 + 2 + 1 = 21$
28. (c) The region common to the triangle and the bigger circle represents the number of self-employed female graduates with bank loan facility. It is  $7 + 5 = 12$ .
29. (c) The region lying outside the triangle but inside the bigger circle represents the number of non-graduate self-employed females with bank loan facility. It is  $(6 + 2 + 1) = 9$ .
30. (c) If one pole is removed, the arrangement would look like as follows :

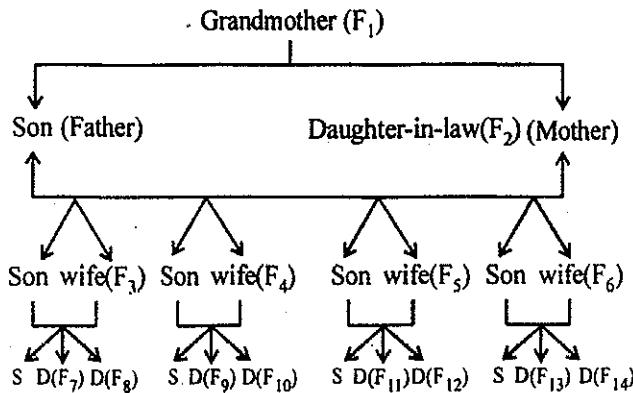


Hence, the distance between any two poles

$$= \frac{45}{5} = 9 \text{ m}$$

31. (a) According to the diagram, the monkey covers  $(5 + 6 + 7 + 8) = 26 \text{ m}$
32. (c) As worked out earlier, the distance between the first pole A and the last pole G = 45 m.
33. (c) 7 is a figure which is fulfilling both people's statements.
34. (a) If the marks are x  
 $3 < x < 8$   
 $6 < x < 10$   
 $x = 7$  satisfies the above conditions.

35. (a)



36. (c)

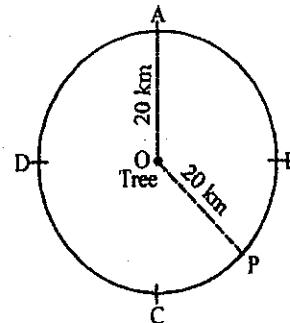
	Management (points)	Mathematics (points)	Physics (points)	Fiction (points)
Possible combinations (No. of books of each subject)	1 (4)	1 (3)	1 (2)	1 (1)
Compulsory combination	2 Fiction (2)	2 Physics (4)	none	none

Thus 2 more books of Physics (4 points) can be carried along with the above said combination by which I can earn a total of 22 points.

37. (a) Distance to courier's destination = 10 km

Weight	Units	Speed (km/h)	Rate Rs/hour	Cost
10	8	5	10	$10 \times 8 \times 2 = 160$
20	4	2	10	$10 \times 4 \times 5 = 200$
40	2	1	10	$10 \times 2 \times 10 = 200$

38. (c) Given a circular ring road connecting points A, B, C and D.



Let O be the centre of ring road and P be the point between B and C where you have to travel from tree (centre).

Since OA and OP are the radius of same ring road. Hence they will be equal.

∴ Required distance = OA = OP = 20 km.

39. (b) The counting pattern of girl can be tabulated as below:

Thumb	Index finger	Middle finger	Ring finger	Little finger
1	2	3	4	5
$9 = 8 + 1$	8	7	6	
	10	11	12	$13 = 8 + 5$
$17 = 16 + 1$	16	15	14	
	18	19	20	$21 = 16 + 5$
$25 = 24 + 1$	24	23	22	
	26	27	28	$29 = 24 + 5$
.....	.....	.....	.....	.....
1993 = 1992 + 1	1992	1991	1990	1989
	1994	1995	1996	$1997 = 1992 + 5$

Hence she ended counting on Index finger.

# **ANALYTICAL REASONING**

In this type of questions, we have to analyse the given information and condense it in a suitable form to answer the questions. Though there exists no set formulae to solve this kind of problems, yet a systematic approach can help to solve questions.

Following examples will help you to develop methodology to solve this type of questions.

*Example 1 :*

**Directions :** Read the following information carefully and answer the questions given below it:

At the end of a cricket series, when five players were arranged in the ascending order of runs scored by them, O was fourth while N was first. When they were arranged in descending order for wickets taken by them, K replaces O while O replaces L. M's position remains unchanged. K has scored more runs than M. L is having first rank in one ranking and fifth in another.



*Solution :*

- | (i) | (b) | <b>Ascending order</b><br>(On the basis of runs scored by them) | <b>Descending order</b><br>(On the basis of wickets taken by them) |
|-----|-----|---|--|
|     |     | N   | L  |
|     |     | M   | M  |
|     |     | K   | N  |
|     |     | O   | K  |
|     |     | L   | O  |

L has scored the highest runs in the series.

- (ii) (d) Q has taken the lowest number of wickets.

**Example 2 :**

**Directions :** Study the information given below to answer the questions that follow :

A certain city is served by six subway lines, designated by the letters A, B and C and the numbers 1, 2 and 3.

**When it snows, morning services on the line B is delayed.**

When it rains or snows, services on the lines A, 2, and 3 is delayed both in morning and afternoon.

When the temperature drops below 30°F, afternoon service is cancelled on either the line A or the line 3, but not both.

When the temperature rises above 90°F, afternoon service is cancelled on either the line C or the line 3, but not both.

When service on the line A is delayed or cancelled, service on the line C, which connects with the A line, is delayed.



### *Solution:*

- (i) (d) 5 lines are affected.
  - (ii) (c) The services on the lines A, 2 and 3 are affected.
  - (iii) (a) In the snowy morning with a temperature of  $45^{\circ}$  F the lines B, A, 2 and 3 or B, A, 2 and C are affected.

**Example 3 :**

**Directions : Read the following information carefully and answer the questions that follow :**



### **Solutions :**

- (I) T stays as PG, S stays in hostel, U stays in hostel and Q stays at home. Now, R does not stay as PG. So, P stays as PG.  
 Clearly, R stays at home.

(II) S studies Physics, R studies Philosophy and T studies Mathematics. Now, P who stays as PG does not study Statistics or History. So, P studies English.  
 Now, the information can be summarized in table as follows –

	Place of stay	Subject
P	PG	English
Q	Home	Statistics or History
R	Home	Philosophy
S	Hostel	Physics
T	PG	Mathematics
U	Hostel	Statistics or History

- (i) (d) P studies English.  
(ii) (a) Clearly the incorrect combination is English—Hostel.  
(iii) (b) S stays in hostel and R stays at home.  
(iv) (c) Q studies History or Statistics.  
(v) (b) Q and R stay at home.

*Example 4 :*

**Directions :** Study the following information carefully and answer the questions given below:



### **Solutions :**

Lecturers	courses	Month
P	B	Jan/Feb/Mar
Q	A	Mar
R	A/B/E	Jan

Now, from the table it is clear that P will teach in February and 'R' will definitely teach the course E. Hence, the table can be made as,

Lecturers	Courses	Month
P	B	Feb
Q	A	Mar
R	E	Jan
S	C/D	Apr/May
T	D/C	May/Apr

- (i) (c) It is clear from above 'table'.  
(ii) (a) After course 'B', lecturer Q's course immediately follows.  
(iii) (b) From above table course 'E' taught in the month of January.

## EXERCISE

**DIRECTIONS (Qs. 1-3) :** Six products U, V, W, X, Y and Z are to be placed in display windows of a shop. There are six display windows – numbered 1, 2, 3, 4, 5, 6 and one product is to be put in one window. Moreover, U cannot be immediately to the left or immediately to the right of V. W must be immediately to the left of X. Z cannot be in window number 6 :

1. Which of the following products cannot be placed in window no. 1 ?
  - (a) U
  - (b) V
  - (c) W
  - (d) X
2. If X is placed in window no. 3, then W must be placed in which window ?
  - (a) 1
  - (b) 2
  - (c) 4
  - (d) 5
3. If U is placed in window no 5, then which of the following products must be placed in window no. 6 ?
  - (a) V
  - (b) W
  - (c) X
  - (d) Y

**DIRECTIONS (Qs. 4-6) :** Read the following information carefully and answer the questions given below :

Six persons A, B, C, D, E and F took up a job with a firm in a week from Monday to Saturday. Each of them joined for different posts on different days. The posts were of— Clerk, Officer, Technician, Manager, supervisor, and Sales Executive, though not respectively. F joined as a Manager on the first day. B joined as a Supervisor but neither on Wednesday nor on Friday. D joined as a Technician on Thursday. Officer joined the firm on Wednesday. E joined as a Clerk on Tuesday. A joined as a Sales Executive.

4. Who joined the firm on Wednesday?
  - (a) B
  - (b) C
  - (c) B or C
  - (d) Data inadequate
5. Who was the last person to join the firm?
  - (a) E
  - (b) F
  - (c) A
  - (d) B
6. On which of the following days did the Sales Executive join?
  - (a) Tuesday
  - (b) Thursday
  - (c) Saturday
  - (d) None of these

**DIRECTIONS (Qs. 7-10) :** Study the following information carefully and answer the questions given below :

In a building there are thirteen flats on three floors— II, III and IV. Five flats are unoccupied. Three managers, two teachers, two lawyers and one doctor occupy the remaining flats. There are at least three flats on any floor and not more than six flats on any floor. No two persons of the same profession stay on any floor. On the second floor, out of four flats, one occupant is the lawyer and has only one neighbour. One teacher lives one floor below the other teacher. The doctor is not the neighbour of any of the lawyers. No flat is unoccupied on the third floor.

7. How many flats are there on the third floor?
  - (a) Three or Four
  - (b) Four
  - (c) Five
  - (d) Three
8. What is the combination of occupants on the second floor?
  - (a) Lawyer, Manager
  - (b) Teacher, Doctor
  - (c) Manager, Doctor
  - (d) Manager, Teacher
9. Who among the following is the neighbour of the other lawyer?
  - (a) Manager
  - (b) Teacher
  - (c) Both the Manager and the Teacher
  - (d) Data inadequate
10. How many flats are occupied on the fourth floor?
  - (a) Two
  - (b) Three
  - (c) Four
  - (d) Data inadequate

**DIRECTIONS (Qs. 11-13) :** Study the following information carefully and answer the questions given below :

Five friends Yash, Neeraj, Mehul, Ram and Prakash are students of five different disciplines— Medical, Engineering, Architecture, Arts, Management. Each plays a different musical instrument Sitar, Tabla, Sarod, Guitar and Violin.

Mehul, a medical student, does not play Sarod or Sitar or Guitar. Prakash is neither a student of Engineering nor Management. Ram, who plays Tabla, is an Arts student. Neither Prakash nor Yash plays Sarod.

11. Who among the following plays Sarod?
  - (a) Yash
  - (b) Neeraj
  - (c) Prakash
  - (d) Data inadequate
12. The guitarist is a student of which of the following disciplines?
  - (a) Engineering
  - (b) Either Engineering or Management
  - (c) Data inadequate
  - (d) None of these
13. Who among the following plays Sitar?
  - (a) Yash
  - (b) Neeraj
  - (c) Data inadequate
  - (d) None of these

**DIRECTIONS (Qs. 14-17) :** Study the following information carefully and answer the questions given below it :

- (i) Seven subjects Sociology, Psychology, English, History, Geography, Economics and Hindi are taught between Monday and Friday by five persons A, B, C, D and E.
- (ii) Each person teaches at least one subject. At least one subject is taught every day. No person teaches two subjects on the same day. B teaches Sociology on Wednesday. History is taught by E but not on Monday or Thursday. English is taught on Monday by A. Geography and Economics are taught on Monday and Tuesday respectively. D teaches only one subject Psychology on Tuesday. Geography is not taught by E or B.

14. Who teaches Geography?  
 (a) C (b) E  
 (c) B (d) Data inadequate
15. Which subject is taught on Friday?  
 (a) Hindi (b) Economics  
 (c) History (d) Data inadequate
16. Who teaches Economics?  
 (a) E (b) A  
 (c) B (d) Data inadequate
17. Which subject is taught on Thursday?  
 (a) History (b) Economics  
 (c) Data inadequate (d) None of these

**DIRECTIONS (Qs. 18-22) :** Study the following paragraph and then answer the questions that follow :

Five golfers C, D, E, F and G play a series of matches in which the following are always true of the results. Either C is the last and G is the first or C is the first and G is the last. D finishes ahead of E. Every golfer plays in and finishes every match. There are no ties in any match, i.e. no two players ever finish in the same position in a match.

18. Which of the following cannot be true ?  
 (a) E finishes second.  
 (b) F finishes second.  
 (c) E finishes ahead of F.  
 (d) F finishes ahead of D.
19. If D finishes third, then which of the following must be true ?  
 (a) G finishes first.  
 (b) E finishes ahead of F.  
 (c) F finishes ahead of E.  
 (d) F finishes behind D.
20. If C finishes first, then in how many different orders is it possible for the other golfers to finish?  
 (a) 1 (b) 2  
 (c) 3 (d) 4
21. Which of the following additional conditions make it certain that F finishes second ?  
 (a) C finishes ahead of D  
 (b) D finishes ahead of F  
 (c) F finishes ahead of D  
 (d) D finishes behind G
22. If exactly one golfer finishes between C and D, then which of the following must be true?  
 (a) C finishes first (b) G finishes first  
 (c) F finishes third (d) E finished fourth

**DIRECTIONS (Qs. 23-27) :** Read the following information carefully to answer the questions that follow :

There are six teachers A, B, C, D, E and F in a school. Each of the teachers teaches two subjects, one compulsory subject and the other optional subject. D's optional subject is History while three others have it as compulsory subject. E and F have Physics

as one of their subjects. F's compulsory subject is Mathematics which is an optional subject of both C and E. History and English are A's subjects but in terms of compulsory and optional subjects, they are reverse of those of D's. Chemistry is an optional subject of any one of them. There is only one female teacher in the school who has English as her compulsory subject.

23. What is C's compulsory subject ?  
 (a) History (b) Physics  
 (c) Chemistry (d) English
24. Who is a female member in the group ?  
 (a) A (b) B  
 (c) C (d) D
25. Who among the following has same optional subjects as that of the compulsory subject of F?  
 (a) D (b) B  
 (c) A (d) C
26. Disregarding which is compulsory and which is the optional subject, who has the same two subjects combination as F ?  
 (a) A (b) B  
 (c) E (d) D
27. Which of the following groups of teachers has History as the compulsory subject?  
 (a) A, C and D (b) B, C and D  
 (c) C and D (d) A, B and C

**DIRECTIONS (Qs. 28-30) :** Answer the questions that follow on the basis of following information :

A team of experts for conducting interviews consists of seven experts – Bhushan, Cyriac, Pramila, Ram, Suresh, Shekhar and Unni. Of these Bhushan, Cyriac and Pramila are experts in social sciences while Suresh and Unni are experts in basic sciences. Ram and Shekhar have exposure in both basic sciences and social sciences. Three panels have to be formed for the interview with a restriction that a panel should have representation from experts with social sciences and basic sciences background. Moreover, at least one member should be an expert of only one area.

28. If Cyriac does not like to be a member of panel with Ram, and Unni was in a panel with Shekhar, then the expert who did not participate in the interview was :  
 (a) Pramila (b) Cyriac  
 (c) Bhushan (d) Any of these
29. If Pramila did not participate in the interview, then who was the person most likely to be with Unni ?  
 (a) Suresh (b) Bhushan  
 (c) Pramila (d) Any of these
30. Unni does not like to be with Shekhar; Ram does not like to be with Pramila and Bhushan had Suresh as the partner. If both Ram and Pramila attended the interview, then who was the partner to Cyriac?

- (a) Cyriac did not attend the interview
  - (b) Shekhar
  - (c) Pramila
  - (d) Unni

**DIRECTIONS (Qs. 31-34) :** Read the following statements to answer the questions that follow :

Group captain Malhotra is choosing the last part of his crew for the spaceship COSMOS, with which he plans to land on the moon. He needs 4 more crew members of whom at least two must be pilots, the others being engineers. The candidates for Pilots are Dalbir, Eric and Farid. The candidates for Engineers are Lal, Monty, Naveen and Paul.

Eric will not be a crew with Lal, Dalbir and Paul will not crew with Naveen.

31. If Naveen is chosen, which of the following must be other members of the crew ?  
(a) Farid, Lal and Monty  
(b) Dalbir, Eric and Monty  
(c) Eric, Farid and Monty  
(d) Eric, Farid and Paul

32. If Paul is chosen, which candidates will NOT be chosen to be on the crew ?  
(a) Dalbir, Eric and Monty  
(b) Dalbir, Eric and Farid  
(c) Dalbir, Farid and Lal  
(d) Eric, Farid and Lal

33. Given the above statements about the relationships among the potential crew members, which of the following must be true ?  
A : If Dalbir is rejected, then Monty must be chosen.  
B : If Dalbir is rejected, then Farid must be chosen.  
C : If Dalbir is chosen, then Paul must also be chosen.  
(a) B only                    (b) C only  
(c) A and B only            (d) A and C only

34. If Lal is chosen as an engineer, which of the following could be the other member of the crew?  
A : Dalbir, Farid and Monty  
B : Dalbir, Farid and Naveen  
C : Dalbir, Farid and Paul  
(a) A only                    (b) B only  
(c) C only                    (d) A and C only

country earlier. The association also wants that the team should be well-kind and friendly but is faced with a situation wherein Yohanna and Anil are not friendly while Zacharia and Chakarvarti don't see eye to eye with each other. To make the matters more difficult, Anil and Bishan do not like each other.

Based on the above requirements and assumptions, answer the following questions :-



**DIRECTIONS (Qs. 39-43) :** Study the following information carefully and answer the questions that follow :

Madhu and Shobha are good in Dramatics and Computer Science. Anjali and Madhu are good in Computer Science and Physics. Anjali, Poonam and Nisha are good in Physics and History. Nisha and Anjali are good in Physics and Mathematics. Poonam and Shobha are good in History and Dramatics.

**DIRECTIONS (Qs. 44-48) :** Study the following information carefully and answer the questions given below it.

In a group of five persons A, B, C, D and E :

1. B and C are intelligent in Mathematics and Geography
  2. A and C are intelligent in Mathematics and History
  3. B and D are intelligent in Political Science and Geography.
  4. D and E are intelligent in Political Science and Biology.
  5. E is intelligent in Biology, History and Political Science.

44. Who is intelligent in Political Science, Geography and

- Biology? (a) E (b) D  
(c) C (d) B

45. Who is intelligent in Mathematics, Political Science and Geography?



46. Who is intelligent in Mathematics and History but not in Geography?



47. Who is intelligent in Mathematics, Geography and History?



48. Who is intelligent in Political Science, History and Biology?



49. In a cricket season, India defeated Australia twice, West Indies defeated India twice, Australia defeated West Indies twice, India defeated New Zealand twice and West Indies defeated New Zealand twice. Which country has lost number of times?



50. Five children were subjected to psychological tests to know intellectual levels. In the report, psychologists pointed out that the child A is less intelligent than the child B. The child C is less intelligent than the child D. The child B is less intelligent than the child E. Which child is the most intelligent?



51. In a chess tournament each of six players will play with every other player exactly once. How many matches will be played during the tournament ?



**DIRECTIONS (Qs. 54-56) :** Read the following information carefully and answer the questions given below.

Ravi and Kunal are good in Hockey and Volleyball. Sachin and Ravi are good in Hockey and Baseball. Gaurav and Kunal are good in Cricket and Voleyball. Sachin, Gaurav and Micheal are good in Football and Baseball.



**DIRECTIONS (Qs. 57-58) :** Read the following information carefully and answer the question given below it :



**DIRECTIONS (Qs. 59-60) :** These questions are based on the following information.

Five men A, B, C D and E read a newspaper. The one who reads first gives it to C. The one who reads last had taken from A. E was not the first or last to read. There were two readers between B and A.

59. B passed the newspaper to whom ?  
(a) A (b) C  
(c) D (d) E

60. Who read the newspaper last ?  
(a) A (b) B  
(c) C (d) D

**DIRECTIONS (Qs. 61-64) :** Study the information below and answer questions based on it.

A leading socialite decided to organise a dinner and invited a few of her friends. Only the host and the hostess were sitting at the opposite ends of a rectangular table, with three persons along each side. The pre-requisite for the seating arrangement was that each person must be seated such that atleast on one side it has a person of opposite sex. Maqbool is opposite Shobha, who is not the hostess. Ratan has a woman on his right and is sitting opposite a woman. Monisha is sitting to the hostess's right, next to Dhirubhai. One person is seated between Madhuri and Urmila who is not the hostess. The men were Maqbool, Ratan, Dhirubhai and Jackie, while the women were Madhuri, Urmila, Shobha and Monisha.

61. The eighth person present, Jackie, must be  
 I. the host II. seated to Shoba's right  
 III. seated opposite Urmila  
 (a) I only (b) III only  
 (c) I and II only (d) II and III only
62. Which of the following persons is definitely not seated next to a person of the same sex?  
 (a) Maqbool (b) Madhuri  
 (c) Jackie (d) Shobha
63. If Ratan would have exchanged seats with a person four places to his left, which of the following would have been true after the exchange?  
 I. No one was seated between two persons of the opposite sex. (e.g. no man was seated between two women)  
 II. One side of the table consisted entirely of persons of the same sex.  
 III. Either the host or the hostess changed seats.  
 (a) I only (b) II only  
 (c) I and II only (d) II and III only
64. If each person is placed directly opposite his or her spouse, which of the following pairs must be married?  
 (a) Ratan and Monisha (b) Madhuri and Dhirubhai  
 (c) Urmila and Jackie (d) Ratan and Madhuri

**DIRECTIONS (Qs. 65-67) :** Study the information below and answer questions based on it.

Five of India's leading models are posing for a photograph promoting "y'know, world peace and understanding". But then, Rakesh Shreshtha the photographer is having a tough time getting them to stand in a straight line, because Aishwarya refused to stand next to Sushmita because Sushmita had said something about her in a leading gossip magazine. Rachel and Anu want to stand together because they are "such good friends, y'know". Manpreet on the other hand cannot get along well with Rachel, because there is some talk about Rachel scheming to get a contract already awarded to Manpreet. Anu believes her friendly astrologer who has asked her to stand at the extreme right for all group photographs. Finally, Rakesh managed to pacify the girls and got a beautiful picture of five beautiful girls smiling beautifully in a beautiful straight line, promoting world peace.

65. If Aishwarya is standing to the extreme left, which is the girl standing in the middle?  
 (a) Manpreet (b) Sushmita  
 (c) Rachel (d) Can't say
66. If Aishwarya stands to the extreme left, which is the girl who stands second from left?  
 (a) Can't say (b) Sushmita  
 (c) Rachel (d) Manpreet
67. If Anu's astrologer tells her to stand second from left and Aishwarya decides to stand second from right, then who is the girl standing on the extreme right?  
 (a) Rachel (b) Sushmita  
 (c) Can't say (d) Manpreet

**DIRECTIONS (Qs. 68-71) :** Study the information below and answer questions based on it.

A, B, C, D, E, F and G are brothers. Two brothers had an argument and A said to B "You are as old as C was when I was twice as old as D, and will be as old as E was when he was as old as C is now". B said to A, "You may be older than F but G is as old as I was when you were as old as G is, and D will be as old as F was when F will be as old as G is".

68. Who is the eldest brother?  
 (a) A (b) E  
 (c) C (d) Can't be determined
69. Who is the youngest brother?  
 (a) B (b) D  
 (c) F (d) Can't be determined
70. Which two are probably twins  
 (a) D and G (b) E and C  
 (c) A and B (d) Can't be determined
71. Which of the following is false?  
 (a) G has 4 older brothers  
 (b) A is older than G but younger than E  
 (c) B has three older brothers  
 (d) There is a pair of twins among the brothers

**DIRECTIONS (Qs. 72-76) :** Study the information below and answer questions based on it.

Bankatlal works x hours a day and rests y hours a day. This pattern continues for 1 week, with an exactly opposite pattern next week, and so on for four weeks. Every fifth week he has a different pattern. When he works longer than he rests, his wage per hour is twice what he earns per hour when he rests longer than he works. The following are his daily working hours for the weeks numbered 1 to 13

	1st week	5th week	9th week	13th week
Rest	2	3	4	-
Work	5	7	6	8

- A week consist of six days and a month consists of 4 weeks
72. If Bankatlal is paid Rs. 20 per working hour in the 1st week, what is his salary for the 1st month?  
 (a) 1440 (b) 2040  
 (c) 1320 (d) 1680

**DIRECTIONS (Qs. 81-82) :** Study the information below and answer questions based on it.

Amar, Akbar, Anthony are three friends. Only three colors are available for their shirts, viz. Red, Green and Blue. Amar did not wear red shirt. Akbar did not wear green shirt. Anthony did not wear blue shirt.

81. If Akbar and Anthony wear the same colour, then which of the following is not true?

  - (a) Amar wears blue and Akbar wears green
  - (b) Amar wears green and Akbar wears red.
  - (c) Amar wears blue and Akbar does not wear blue
  - (d) Anthony wears red

82. If two of them wear the same colour then how many of the following must be false

  - I. Amar wears blue and Akbar does not wear green
  - II. Amar does not wear blue and Akbar wears blue.
  - III. Amar does not wear blue and Akbar does not wear blue
  - IV. Amar wears green. Akbar does not wear red. Anthony does not wear green
  - (a) 0
  - (b) 1
  - (c) 2
  - (d) 3

**DIRECTIONS (Qs. 83) :** Study the information and answer question.



**DIRECTIONS (Qs. 84-87) :** Study the information below and answer questions based on it.

Bankatlal acted as a judge for the beauty contest. There were four participants, viz. Ms. Andhra Pradesh, Ms. Uttar Pradesh, Ms. West Bengal and Ms. Maharashtra. Mrs. Bankatlal, who was very anxious about the result asked him about it as soon as he was back home. Bankatlal just told that the one who was wearing the yellow saree won the contest. When Mrs. Bankatlal pressed for further details, he elaborated as follows:

- I. All of them were sitting in a row
- II. All of them wore sarees of different colors, viz. Green, Yellow, White, Red
- III. There was only one runner up and she was sitting beside Ms. Maharashtra
- IV. The runner up was wearing the Green saree
- V. Ms. West Bengal was not sitting at the ends and was not a runner up
- VI. The winner and the runner up are not sitting adjacent to each other
- VII. Ms. Maharashtra was wearing white saree
- VIII. Ms. Andhra Pradesh was not wearing the Green saree
- IX. Participants wearing Yellow saree and White saree were at the ends
84. Who wore the Red saree?
  - (a) Ms. Andhra Pradesh
  - (b) Ms. West Bengal
  - (c) Ms. Uttar Pradesh
  - (d) Ms. Maharashtra
85. Ms. West Bengal was sitting adjacent to.....
  - (a) Ms. Andhra Pradesh and Ms. Maharashtra
  - (b) Ms. Uttar Pradesh and Ms. Maharashtra
  - (c) Ms. Andhra Pradesh and Ms. Uttar Pradesh
  - (d) Ms. Uttar Pradesh only
86. Which saree was worn by Ms. Andhra Pradesh?
  - (a) Yellow
  - (b) Red
  - (c) Green
  - (d) White
87. Who was the runner up?
  - (a) Ms. Andhra Pradesh
  - (b) Ms. West Bengal
  - (c) Ms. Uttar Pradesh
  - (d) Ms. Maharashtra

**DIRECTIONS (Qs. 88-90) :** Study the given information carefully and answer the questions that follow :

- (i) There are six friends A, B, C, D, E and F.
  - (ii) Each one is proficient in one of the games, namely Badminton, Volleyball, Cricket, Hockey, Tennis and Polo.
  - (iii) Each owns a different coloured car, namely, yellow, green, black, white, blue and red.
  - (iv) D plays Polo and owns a yellow coloured car.
  - (v) C does not play either Tennis or Hockey and owns neither blue nor yellow coloured car.
  - (vi) E owns a white car and plays Badminton.
  - (vii) B does not play Tennis, he owns a red coloured car.
  - (viii) A plays Cricket and owns a black car.
88. Who plays Volleyball?
- (a) B
  - (b) C
  - (c) F
  - (d) Data inadequate
89. Which coloured car F owns?
- (a) Green
  - (b) Blue
  - (c) Either Green or Blue
  - (d) Data inadequate
90. Which of the following combinations of colour of car and game played is not correct?
- (a) Yellow — Polo
  - (b) Green — Tennis
  - (c) Black — Cricket
  - (d) Red — Hockey

# SOLUTIONS

1. (d) As W is to be placed immediately to the left of X, we cannot place X in window 1.
2. (b) Clearly, W must be placed in window no. 2 as dictated by the restrictions.
3. (d) If U is placed in window no. 5, then Y will placed in window 6.
- 4-6 Clearly, C joined as an officer. Since, B joined on neither Wednesday nor Friday. Therefore, B joined on Saturday and A joined on Friday. These information can be summarized as follows :

Person	Post	Day
F	Manager	Monday
B	Supervisor	Saturday
D	Technician	Thursday
C	Officer	Wednesday
E	Clerk	Tuesday
A	Sales Executive	Friday

4. (b)
5. (d)
6. (d)

7-10. Total Number of flats = 13; Unoccupied flats = 5

Occupied flats = 8

Number of flats on second floor = 4

Second floor comprises four flats. One occupant is lawyer and since he has only one neighbour, this implies that out of four flats on second floor, two are unoccupied.

Again, since no flat is unoccupied on the third floor, it implies that there are three unoccupied flats on floor IV.

Since there are at least three flats on any floor and no two same profession stay on any floor and the doctor is not the neighbour of any lawyer, then floor III comprises only three flats. Thus, floor IV comprises six flats (3 occupied + 3 unoccupied).

Since there are three managers and no two same profession stay on any floor, therefore, there will be a manager in each floor. Also there are only two occupant in second floor and one of them is lawyer, therefore, second occupant should be manager.

Again, since there are two teachers, there will be a teacher each on floors III and IV. Again, doctor can't be neighbour of a lawyer. Hence, the doctor and lawyer will not reside on same floor. Therefore, on floor III – either Doctor or Lawyer then,

on floor IV – either Lawyer or Doctor.

Floor	Total Flats	Occupied flats	Unoccupied flats	Occupants
II	4	2	2	Lawyer, Manager
III	3	3	0	Teacher, Manager, Lawyer or Doctor
IV	6	3	3	Teacher, Manager, Doctor or Lawyer

7. (d) Clearly, there are three flats.
8. (a) From above table that combination is Lawyer & Manager.
9. (c) Both the manager and the teacher are the neighbour of other lawyer.
10. (b) There are three flats occupied.

11-13.

Name	Discipline					Musical Instrument				
	Med	Eng	Ar	Art	Mg	Sit	Tab	Sar	Qui	Viol
Neeraj	x	—	x	x	—	x	x	✓	x	x
Yash	x	—	x	x	—	—	x	x	—	x
Mehul	✓	x	x	x	x	x	x	x	x	✓
Ram	x	x	x	✓	x	x	✓	x	x	x
Prakash	x	x	✓	x	x	—	x	x	—	x

11. (b)
12. (c) Guitarist is either Yash or Prakash. Therefore discipline may be Engineering or Architecture or Management.
13. (c)

14-17.

As History is not taught on Monday or Thursday, it must be taught on Friday. Since it is given that at least one subject is taught every day, this helps to match Hindi — Thursday. As D teaches only one subject (Psychology) and Geography is not taught by E or B and from the information: No person teaches two subjects on the same day, it is clear that C teaches Geography (since A teaches English on Monday). Hence, the above information can be summarized in table as follows –

Subject	Person	Day
Sociology	B	Wednesday
History	E	Friday
English	A	Monday
Geography	C	
Economics	B/E/A/C	Tuesday
Psychology	D	

From above table.

14. (a) C teaches Geography.  
 15. (c) History taught on Friday.  
 16. (d) From given dates it is not clear.  
 17. (d) Hindi is taught on Thursday.  
 18. (a) Either C or G has to be first and D has to come before E. Hence, E cannot finish second.  
 19. (c) F finishes second when D finishes third. Thus F finishes ahead of E. Therefore, option (c) is correct.  
 20. (c) In the event of C finishing first, G finishes last and we will have the following three possible ordering of finishes.  
 CFDEG, CDEFG and CDDEG.
21. (c) When F finishes ahead of D, than F will definitely finish at the second place.  
 22. (d) When there is exactly one golfer between C and D, then E finishes at the fourth place.
- 23-27. The given information is summarised in a table as follows:

Teachers	Subjects	
	Compulsory	Optional
A	History	English
B	History	Chemistry
C	History	Mathematics
D (Female)	English	History
E	Physics	Mathematics
F	Mathematics	Physics

23. (a) History is the compulsory subject of C.  
 24. (d) D is a female member in the group.  
 25. (d) The compulsory subject of F (Mathematics) is the optional subject of C.  
 26. (c) E has physics and Mathematics as his two subjects.  
 27. (d) A, B and C all have History as the compulsory subjects.  
 28. (d) Three panels can be found as follows:

- (i) Unni – Shekhar  
 Cyriac – Suresh  
 Bhushan – Ram  
 Pramila does not participate

OR

- (ii) Unni – Shekhar  
 Cyriac – Suresh  
 Pramila – Ram  
 Bhushan does not participate

OR

- (iii) Unni – Shekhar  
 Pramila – Ram

- Bhushan – Suresh  
 Cyriac does not participate.  
 29. (b) The possible panel is:  
 Cyriac – Shekhar  
 Suresh – Ram  
 Unni – Bhushan  
 30. (a) Panel can be as follows.  
 Bhushan – Suresh  
 Unni – Ram  
 Pramila – Shekhar  
**31-34. Group Captain – Malhotra**  
 Additional No. of crew = 4  
 At least two are pilots.  
 While others are engineers.  
 Candidates for engineers : Lal, Monty, Naveen and Paul.  
 Candidates for pilots : Dalbir, Eric and Farid.  
 31. (c) As Naveen is chosen, Dalbir and Paul cannot be chosen. Therefore, the pilots chosen are Eric and Farid. Eric cannot be a crew with Lal. Hence, Monty will be chosen.  
 32. (d) As it has been stated, Eric cannot be a crew with Lal.  
 33. (c) Both A and B are true.  
 34. (d) If Lal is chosen as one of the engineers, Eric will not be chosen. In the given conditions both A and C give logical possibilities.  
 35. (b) If Zacharia is included, Chakravarti should not be selected while Anil should not be selected when Yohana is selected. Therefore, other athletes in the group may be Bishan and Dalbir.  
 36. (b) If Bishan is selected and Yohana is rejected, then Wasim should be included as the player who was earlier represented in Olympics. Now, Anil is not to be in team as Bishan is there and Chakravarty has to be rejected as Zacharia is in team. Therefore, the team consists of Wasim, Zacharia, Dalbir and Bishan.  
 37. (a) Other athletes in the team are Zacharia, Wasim and Dalbir.  
 38. (d) All the three statements are not true.

**39-43.**

	Dramatics	Computer Sec.	Physics	History	Mathematics
Madhu	✓	✓	✓		
Shobha	✓	✓		✓	
Anjali		✓	✓	✓	✓
Poonam	✓		✓	✓	
Nisha			✓	✓	✓

39. (c) Shobha

40. (c) Madhu

41. (a) Poonam  
42. (d) Anjali  
43. (c) Nisha  
44-48.

We prepare a table from the given data as under :

	Maths	Geography	History	Political Sc.	Bio
A	✓	x	✓	✓	x
B	✓	✓	x	✓	x
C	✓	✓	✓	—	x
D	x	✓	x	✓	✓
E	x	x	✓	✓	✓

44. (b) Clearly, from the table D is intelligent in Political Science, Geography and Biology.  
45. (b) B is intelligent in Mathematics, Political Science and Geography.  
46. (c) A is intelligent in Mathematics and History but not in Geography.  
47. (d) C is intelligent in Mathematics, History and Geography.  
48. (d) E is intelligent in Political Science, History and biology.  
49. (c) Australia was defeated twice by India.  
India was defeated twice by West Indies.  
West Indies was defeated twice by Australia.  
New Zealand was defeated twice by India and twice by West Indies, i.e., 4 times in all.

50. (c) We have A < B, C < D, B < C and E < A  
So the sequence becomes E < A < B < C < D  
Clearly, child D is the most intelligent.  
51. (b) Total number of matches played = number of combination of six players taken 2 at a time

$$= {}^6C_2 = \frac{6 \times 5}{2} = 15.$$

This method is for those who had mathematics as one of the subjects in 12<sup>th</sup> Exam.

52. (a) There were all sparrows but 'six' means that six birds were not sparrows but only pigeons and ducks.  
⇒ No. of pigeons + No. of ducks = 6, similarly  
No. of sparrows + No. of ducks = 6 and  
No. of sparrows + No. of pigeons = 6  
Adding we have

$$\therefore 2(\text{no. of pigeons} + \text{ducks} + \text{sparrows}) = 18 \\ \text{or No. of pigeons} + \text{ducks} + \text{sparrows} = 18 \div 2 = 9.$$

53. (a) When the son is born, let the father be 'x' years of age.  
When his son is 'x' years old, then father is '2x' years old.  
⇒  $2x = 36$  or  $x = 18$   
∴ 5 years ago, son is 13 years old.

54-56. The given information can be analyzed as under :

	Hockey	Volleyball	Baseball	Cricket	Football
Ravi	✓	✓	✓		
Kunal	✓	✓		✓	
Sachin	✓		✓		✓
Gaurav		✓	✓	✓	✓
Michael		✓		✓	✓

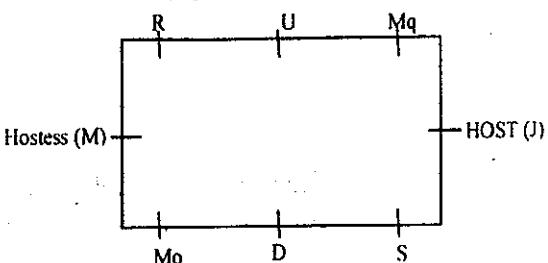
54. (b) Kunal is good in Hockey, Cricket and Volleyball.  
55. (c) Gaurav is good in Baseball, Cricket, Volleyball and Football.  
56. (c) Ravi is good in Baseball, Volleyball and Hockey.  
57. (b) In terms of height, we have

Gopal < Ashok, Kunal < Gopal, Navin < Kunal,  
Navin < Jayesh, Jayesh < Ashok.

So, the sequence becomes :

Navin < Kunal < Gopal < Jayesh < Ashok.  
Clearly, Ashok is the tallest.

58. (c) Clearly, statement (C) is not necessary.  
59-60. C is the second reader. A is the second last reader.  
E is not the first or last to read. So, E is the third reader. There were two readers between B and A.  
So, the order of reading the newspaper is : B, C, E, A, D.  
59. (b) B passed the newspaper to C.  
60. (d) D read the newspaper last.



Jakie is the host and seated to shobha's right

62. (d) Shobha is a person who is seated between Dhirubhai and Jackie

63. (a) Only statement (I) would be true if R → S  
64. (a) Ratan and Monisha are sitting just opposite to each other. Hence, they must be married.

65. (b) 

Aish	Man	Sush	Rachel	Anu
------	-----	------	--------	-----

  
If Aishwarya is a girl in extreme left then, the girl in the middle is Sushmita.

66. (d) Manpreet (from above)

67. (d) 

Sush	Anu	Rach	Aish	Man
------	-----	------	------	-----

  
Manpreet is on the extreme right.

68-71.

B is as old as C was when I was twice as old as D

$$\Rightarrow C > B, A > D \quad \dots \text{(i)}$$

B will be as old as E was when he was as old as C is now

$$\Rightarrow E > B, E > C \quad \dots \text{(ii)}$$

A may be older than F but G is as old as B was when A was as old as G is

$$\Rightarrow A > F, B > G \text{ and } A = B \quad \dots \text{(iii)}$$

D will be as old as F was when F will be as old as G is

$$F > D, G > F \quad \dots \text{(iv)}$$

From (i), (ii), (iii) and (iv)

$$E > C > A = B > G > F > D$$

68. (b) Eldest brother - E

69. (b) Youngest brother - D

70. (c) Twins - A & B

71. (c) B has only 2 elder brothers

72. (a) Salary in the first week = Rs 20 per working hour  
As the working pattern changes next week, so wage/hr

$$\text{for the 2nd and fourth week} = \frac{20}{2} = 10$$

Work and Rest hrs/day for the 2nd and 4th weeks respectively are 2 and 5 hrs.

A week consist of 6 days and a month of 4 week

$$\text{Salary from 1st and 3rd week} = 20 \times 5 \times 2 \times 6 = \text{Rs } 1200$$

$$\text{Salary for 2nd and 4th week} = 2 \times 10 \times 6 \times 2 = \text{Rs } 240$$

$$\text{Salary for 1st month} = 1200 + 240 = \text{Rs } 1440$$

73. (c) Salary for 5th and 7th week =  $2 \times 7 \times 20 \times 6 = \text{Rs } 1680$

$$\text{Salary for 6th and 8th week} = 2 \times 3 \times 10 \times 6 = \text{Rs } 360$$

$$\text{Salary for 2nd month} = 1680 + 360 = \text{Rs } 2040$$

Similarly salary for 3rd month

$$= 2(6 \times 20 \times 6) + 2(4 \times 10 \times 6) \\ = 1440 + 480 = \text{Rs } 1920$$

$$\text{Salary for 4th month} = 2(8 \times 20 \times 6) + 2(0) = \text{Rs } 1920$$

$$\text{Salary at the end of 4 months} = 1440 + 2040 + 1920 + 1920 \\ = \text{Rs } 7320$$

$$\therefore \text{Average monthly salary} = \frac{7320}{4} = \text{Rs } 1830$$

74. (b) Under new scheme salary for 9th and 11th week

$$= 2(25 \times 6 - 5 \times 4) \times 6 = \text{Rs } 1560$$

$$\text{Now salary for 10th and 12th week} = 2(25 \times 4 - 5 \times 6) \times 6 \\ = \text{Rs } 840$$

$$\text{Total salary for 3rd month} = 1560 + 840 = \text{Rs } 2400$$

$$\text{Under previous scheme total salary for 3rd month} = \text{Rs } 1920$$

$$\text{Difference} = 2400 - 1920 = \text{Rs } 480$$

75. (b) According to conditions salary for first 3 months

$$= 1440 + 2040 + 2400 = \text{Rs } 5880$$

Salary for 4th month (13th to 16th week)

$$= 2(25 \times 8 \times 6) + 2(0 - 8 \times 5 \times 6) = 2400 - 480 = \text{Rs } 1920$$

$$\text{Total salary for 16 weeks} = 5880 + 1920 = \text{Rs } 7800$$

76. (a) Since 1996 is a leap year.

25th Feb, 96 will be Wednesday. Since Raja doesn't have any holidays, he completes the job in 7 days.

So, one person can do  $\frac{1}{7}$  th of the work per day

therefore on 25th T and J complete  $\frac{2}{7}$  th of the day. T

will not work on 26th i.e. Thursday. So,  $\frac{1}{7}$  th work done

on 26th. Now  $\frac{4}{7}$  th job remains which will be done on Friday and Saturday.

$\therefore$  T and J complete the job in 4 days.

77. (c) Raja doesn't take any holiday so he complete job in 38 days each person by himself can complete the job in 38 days if he would not take any holiday. In one day, T and S together can complete  $\frac{2}{38}$  th of the work. Since T takes holiday on Tuesday and Thursday and S takes holiday on Saturday and Sunday.

Therefore, in the one week they can do  $\frac{10}{38}$  th of the work.

In the 3rd weeks  $\rightarrow \frac{30}{38}$

In the 4th week  $\rightarrow \frac{2}{38} + \frac{1}{38} + \frac{2}{38} + \frac{1}{38} + \frac{1}{38} = \frac{8}{38}$

Hence, it is completed on 22nd March.

78. (a) To find maximum number of coins collected by one, we find the minimum number of coins collected by other three

$$\text{Hence, maximum} = 100 - (10 + 12 + 14) = 64$$

79. (c) A collected 54 Coins

No. of coins for rest of the three = 46

to find the second highest i.e. highest amongst these three, we use the same method as above:

$$\text{Hence, second highest} = 46 - (10 + 12) = 24$$

$$\text{Difference between highest and second highest} \\ = 54 - 24 = 30$$

80. (d) A = 54 coins

So, no. of coins collected by B, C, D = 100 - 54 = 46

If no. of coins collected by C = x

$$\therefore \text{by B} = 2x + 2$$

$$\therefore 2x + 2 + x + y = 46$$

where y is the no. of coins which D have.

Minimum value of y is 10.

$$\therefore 3x + 2 < 36 \Rightarrow x < \frac{34}{3}$$

$\therefore x = 10$  and  $y = 12$  and or B have 22.

Hence, coin collected by B = 22

Colours	Amar	Akbar	Anthony
Red	x		
Green		x	
Blue	✓		✗

81. (a) From option (a), Amar — Blue  
Akbar — Green (not possible)

From option (b), Akbar — Red

Anthony — Red

From option (c), Amar — Blue

Akbar — except blue (red)

Anthony — Red

From option (d), Amar — Green or Blue

Akbar — Red

Anthony — Red

Thus only option (a) is not possible.

82. (a) According to above table statement II and IV are false.

83. (a) If number of chocolates is  $N_C$  then those of biscuits

$$N_B = 2N_C$$

and number of apples i.e  $N_A > 3N_C$

also, total amount spent

$$= 2N_A + N_C + \frac{1}{4}(2N_B) = 2N_A + 2N_C$$

(note that amount of money spent is even number)

option (b)  $33 = 8 + 24 + 1$

but  $2N_A \neq 25$

option (c) is not possible

minimum Rs that can be spent =  $10[4 \times 2 + 1 \times 1 + 2 \times 1/2]$

So, option (a)  $34 = 8 + 24 + 2$

$2N_A$ ,  $[N_A > 3N_C$  also]

even satisfied

So, option (a) is correct

84. (b)

	Winner (1st)		Runner (2nd)	
Colour	Yellow	Red	Green	White
Sitting arrangement	A	W	U	M

So, Ms. West Bengal wore red saree.

85. (c) From the above solved table Ms. West Bengal was

sitting together with Ms. A and Ms. U.

86. (a) Ms. AP has worn yellow saree.

87. (c) Ms. U was runner up.

88-90.

	Game	Colour of Car
A	Cricket	Black
B	Hockey	Red
C	Volleyball	Green
D	Polo	Yellow
E	Badminton	White
F	Tennis	Blue

88. (b) C plays Volleyball.

89. (b) F owns a blue car.

90. (b) Clearly, the incorrect combination is Green — Tennis.

○○○

# 18

CHAPTER

## ASSERTION AND REASON

‘Assertion’ means ‘stating something’ and ‘Reason’ means ‘fact’.

In this type of questions, we have to deal with the combination of Assertion (A) and Reason (R).

**Directions (for Examples 1 to 6) :** Choose the correct alternative from the following option for the Assertion (A) and Reason (R) given below. Give answer as

- (a) if both A and R are true and R is the correct explanation of A.
- (b) if both A and R are true and R is not the correct explanation of A.
- (c) if A is true but R is false.
- (d) if A is false but R is true.

### Example 1 :

Assertion (A) : Indian president is the head of the state.

Reasons (R) : Indian Parliament consists of the president, Lok Sabha and Rajya Sabha.

### Solution :

- (b) R is not the correct explanation of A.

### Example 2 :

Assertion (A) : Bangladesh imports jute from India.

Reason (R) : Bangladesh has most of the jute mills.

### Solution :

- (d) A is false but R is true.

### Example 3 :

Assertion (A) : Mercury is the farthest planet from the Sun.

Reason (R) : Mercury is the smallest planet in the entire Solar- System.

### Solution :

- (d) Mercury is the smallest planet, but it is not the farthest planet. Hence, our answer is (d).

### Example 4 :

Assertion (A) : Cotton is grown in alluvial soils.

Reason (R) : Alluvial soils are very fertile.

### Solution :

- (d) Cotton is grown in Black soils.

### Example 5 :

Assertion (A) : Simla is colder than Delhi

Reason (R) : Simla is at higher altitude as compared to Delhi.

### Solution :

- (a) The temperature decreases with the altitude and Simla is situated in lesser Himalaya.

### Example 6 :

Assertion (A) : Bronze is used for making statues.

Reason (R) : Bronze is an alloy of copper and tin.

### Solution :

- (b) Both A and R are true. But Bronze is used for making statue because it is resistance to corrosion.

## EXERCISE

**DIRECTIONS (Qs. 1-14) :** Each of the following questions consists of two statements – one labelled as the Assertion (A) and other as Reason (R). You have to examine these two statements carefully and select the answer :

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) Both A and R are false.

1. Assertion (A) : Forest cutting is undesirable from the point of view of soil erosion.

Reason (R) : Cutting of forests reduces the interception of rain water.

2. Assertion (A) : Photosynthesis takes place in all green plants.

Reason (R) : Chlorophyll is essential for photosynthesis.

3. Assertion (A) : Vaccines prevent diseases.

Reason (R) : Vaccines must be given to children.

4. Assertion (A) : There is rainbow in the sky only after rains.

Reasons (R) : Water drops suspended in the air break up sun rays into seven colours.

5. Assertion (A) : Tamil Nadu gets most of the rainfall in winter.

Reason (R) : Tamil Nadu gets rainfall from retreating Monsoons.

6. Assertion (A) : Diamond is used for cutting glass.

Reason (R) : Diamond has a high refractive index.

7. Assertion (A) : Tides indicate the regular and periodic rise and fall in sea level.

Reason (R) : Tides are caused by the gravitational pull of the moon and the sun.

8. Assertion (A) : Goitre is a common disease in mountainous regions.

Reason (R) : The diet of the people in mountains lacks iodine content.

9. Assertion (A) : India is a democratic country.

Reason (R) : India has a Constitution of its own.

10. Assertion (A) : Bulb filament is made of Titanium.

Reason (R) : The filament should have low melting point.

11. Assertion (A) : Amoebiasis is an occupational disease.

Reason (R) : Amoebiasis is caused by inhalation of asbestos dust.

12. Assertion (A) : A person with blood group O positive is supposed to be a universal recipient.

Reasons (R) : Type O positive does not contain any antigens.

13. Assertion (A) : Safety fuses are made up of materials having a high melting point.

Reasons (R) : Safety fuses should be resistant to electric current.

14. Assertion (A) : Sprouting should not be done before consuming the grains.

Reasons (R) : Sprouting kills many vital vitamins.

**Direction (Qs. 15-31) :** Each of the following questions consists of two statements – one labelled as the Assertion (A) and other as Reason (R). You are to examine these two statements carefully and select the answer :

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

15. Assertion (A) : Leakages in household gas cylinders can be detected.

Reason (R) : LPG has a strong smell.

16. Assertion (A) : Cut fruits and vegetables should not be kept in open for long.

Reason (R) : Their vitamin content is ruined.

17. Assertion (A) : Telephone wires sag more in summer.

Reason (R) : They expand due to summer heat.

18. Assertion (A) : Most of the ancient civilisations grew near the rivers.

Reason (R) : The main occupation of man was agriculture.

19. Assertion (A) : Earthworms are not good for agriculture.

Reason (R) : Earthworms break down the soil into the fine particles and make it soft.

20. Assertion (A) : When a body is dipped in a liquid fully or partially, there is a decrease in its weight.

Reasons (R) : The decrease in weight is due to the higher density of the displaced liquid.

21. Assertion (A) : When a person is standing in a lift which is either at rest or moving up or moving down with uniform speed, he does not find any apparent change in his weight.  
Reasons (R) : The reaction of the floor of the lift is equal to his weight.
22. Assertion (A) : A saltwater fish drinks sea water where a fresh water fish never drinks water.  
Reasons (R) : A saltwater fish is hypertonic to its environment while a freshwater fish is hypotonic to its environment.
23. Assertion (A) : The territory of India is larger than the territories of the States taken together.  
Reasons (R) : India is Union of States.
24. Assertion (A) : Alcohol rather than mercury is used in a thermometer to measure a temperature of 60°C.  
Reasons (R) : Alcohol has a lower freezing point than mercury.
25. Assertion (A) : Noise pollution is an unwanted accumulation of noise in the atmosphere.  
Reasons (R) : It interferes with communication.
26. Assertion (A) : The steam engine was invented by James Watt.  
Reasons (R) : There was a problem of taking out water from flooded mines.
27. Assertion (A) : Earthworms are not good for agriculture.  
Reasons (R) : Earthworms break down the soil into fine particles and make it soft.
28. Assertion (A) : Most of the ancient civilisations grew near the rivers.  
Reasons (R) : The main occupation of man was agriculture.
29. Assertion (A) : Food materials should not be soaked in water for a long time.  
Reasons (R) : Washing leads to loss of vitamin A and vitamin D from the food stuff.
30. Assertion (A) : Pluto is the coldest planet.  
Reasons (R) : It receives slanting rays of the sun.
31. Assertion (A) : Akbar found Din-e-Illahi  
Reasons (R) : He was motivated by self glorification.

# SOLUTIONS

1. (a) Cutting down trees causes increased run-off (water flowing over the surface of the earth). Rain water reaches rivers faster (due to reduction of interception). Soil particles are transported down-hill by water flow which leads to the degradation of soil.
2. (b) Both A and R are true but R does not explain the A. They are independent statements.
3. (b) Both A and R are true but R does not explain the A. They are independent statements.
4. (a) Clearly, both A and R are true and R is the correct explanation of A.
5. (a) Both A and R are true and R is the correct explanation of A.
6. (b) Diamond being very hard substance is used to cut glass.
7. (a) Clearly, both A and R are true and R is the correct explanation of A.
8. (a) Goitre is caused by deficiency of iodine and diet in mountainous areas lacks iodine.
9. (b) Both A and R are true. But India is a democratic country because its government is the government of the people, for the people and by the people.
10. (d) Bulb filament is made of Tungsten. The filament should have very high melting point.
11. (d) Both A and R are false. Amoebiasis is an intestinal parasitic illness caused by a single celled microscopic parasite called Entamoeba histolytica.
12. (e) Both Assertion and Reason are false because the person with blood group O positive is the universal blood donor and similarly O positive blood group contains antigens.
13. (e) Safety fuses are made up of metal having low melting point to avoid any accident in case of short-circuit also the safety fuses should not be resistant to electric current.
14. (e) Both Assertion and Reason are false because sprouted grains are used to increase the nutrient content of the grains.
15. (c) R is false as LPG does not have any smell. A chemical called 'Mercaptan', which has a strong purgative smell, is added to LPG so as to detect leakages in houses.
16. (a) When cut fruits and vegetables are kept in open, the vitamins in them get oxidised and remain of no use.
17. (a) Due to heat in summer, wires get loose because of heat.
18. (a) Most ancient civilisations grew near the rivers, because of fertile land and availability of water necessary for agriculture, the main occupation of man.
19. (d) Earthworms help in agriculture because they make the soil soft and porous.
20. (c) 'A' is true but 'R' is false. The decrease in weight is due to the upward thrust (or buoyant force) which is equal to the rate of the liquid displaced by the body.
21. (a) As the reaction of the floor and weight of the person balance each other, there is not any apparent change in his weight.
22. (d) 'A' is wrong but 'R' is correct.
23. (b) Both are 'A' and 'R' correct but 'R' is not the correct explanation of 'A'. The territory of India comprises Union territories as well.
24. (d) Both A and R are true but R is not correct explanation of A because alcohol is used for higher boiling point than Mercury.
25. (a) Noise pollution interferes with communication hence is an unwanted accumulation of noise in the atmosphere.
26. (c) Assertion is correct but Reason is false.
27. (d) Earthworms make the soil fertile, hence Assertion is false and Reason is true.
28. (b) The Assertion is correct because most of the ancient civilisation grew near the rivers as land over there was fertile and water was available. But Reason is not the correct explanation of the Assertion.
29. (c) Food materials should not be soaked in water for a long time because it leads to loss of vitamins. However, the Reason is false.
30. (c) Pluto is the farthest planet from the sun, and hence is the coldest planet. However, Reason is false.
31. (c) Assertion is correct because Din-e-Illahi was founded by Akbar but the Reason is false.

# 19

CHAPTER

## STATEMENT AND ASSUMPTIONS

In this type of questions, a statement is given followed by two or more assumptions. We are required to assess the given statement and decide which of the given assumptions is implicit in the statement.

### 1. What is an assumption?

**Ans.** An assumption is something that can be supposed or assumed on the basis of the given statement.

### SOME TIPS ON ASSUMPTIONS:

#### (I) Key words

For evaluating an assumption, we can take a clue from some words that lend a definite meaning to the statement.

For example, 'all', 'only', 'each', 'every' etc. are definitive in nature whereas 'a few', 'some', 'many' etc. are not.

#### (II) Adjectives

An adjective is something which denotes a quality of the subject. If an adjective is attached to any subject, it must be assumed that the subject have the quality as denoted by the adjective.

**DIRECTIONS (for Examples 1 to 3):** In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit. Give answer :

- (a) if only assumption I is implicit.
- (b) if only assumption II is implicit.
- (c) if either I or II is implicit.
- (d) if both I and II are implicit.
- (e) if neither I nor II is implicit

### Example 1 :

**Statement :** India must earn a lot of foreign exchange to achieve her target of economic development.

**Assumptions :** I. India desires to achieve the target of economic development.  
II. It is possible for India to earn more foreign exchange.

### Solution :

- (d) I is implicit. Tools for an objective are talked about only when the desire for such an objective exists. II is implicit because it makes no sense to talk of something without the existence of its possibility.

### Example 2 :

**Statement :** An advertisement : If you want to follow the footprints of an ideal leader, wear 'X' brand of shoes.

**Assumptions :** I. Most people like to become ideal leaders.  
II. One can't become ideal leader unless one wears 'X' brand of shoes.

### Solution :

- (a) I is implicit; that is why the advertisement has been given. Second one is absurd.

### Example 3 :

**Statement :** Central Bank, which is the largest bank in the country, has decided to reduce its workforce by 30 per cent so that its banks may work efficiently.

**Assumptions :** I. The Bank can perform all its activities after the reduction in workforce.  
II. The surplus employees may be asked to adopt early retirement scheme before leaving the bank.

### Solution :

- (a) I is not implicit because of the word 'all'. II may or may not be a method of reducing the workforce. Hence, II is not implicit.

**DIRECTIONS (for Examples 4 to 6):** In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit. Give answer :

- (a) if only assumption I is implicit.
- (b) if only assumption II is implicit.
- (c) if either I or II is implicit.
- (d) if neither I nor II is implicit.

**Example 4 :**

**Statement :** "Private Property, trespassers will be prosecuted" — A notice on a plot of land.

- Assumptions :**
- The passerby may read the notice and may not trespass.
  - The people are scared of prosecution and, therefore, never trespass.

**Solution :**

(a) Whenever such notices are displayed it is assumed that those who are concerned with the notice will read the notice and follow the messages in it. Hence I is implicit. The notice has been placed making the intention of prosecution clear. But it cannot be said certainly. Hence II is not implicit.

**Example 5 :**

**Statement :** The nutritional status of children in India is better compared to that in other developing countries.

- Assumptions :**
- It is not possible to estimate nutritional requirement of children in other countries.
  - India can become a developed country.

**Solution :**

(d) Assumption I contradicts the statement. Nothing can be assumed about the scale of becoming developed. Hence II is not implicit.

**Example 6 :**

**Statement :** Please do not use lift while going down — an instruction on the top floor of a five-storey building.

- Assumptions :**
- While going down, the lift is unable to carry any load.
  - Provision of lift is a matter of facility and not of right.

**Solution :**

(d) Both I and II are not implicit as they are out of context. Nothing has been mentioned in the statement.

**EXERCISE**

**DIRECTIONS (Qs. 1-14) :** In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit. Give answer :

- (a) if only assumption I is implicit.  
 (b) if only assumption II is implicit.  
 (c) if either I or II is implicit.  
 (d) if neither I nor II is implicit.

1. **Statement :** In case of any difficulty about this case, you may contact our company's lawyer.

- Assumptions :**
- Each company has a lawyer of its own.
  - The company's lawyer is thoroughly briefed about this case.

2. **Statement :** "The programme will start at 6 p.m. but you can come there upto 7 p.m. also and still there is no problem."

- Assumptions :**
- The programme will continue even after 7 p.m.
  - The programme may not even start by that time.

3. **Statement :** Health is the foundation of well-being, virtue, prosperity, wealth, happiness and salvation.

- Assumptions :**
- Happiness results in health and well-being.
  - People desire to be happy, prosperous and virtuous.

4. **Statement :** Last century was the century of fundamental rights and let the forthcoming century become that of excellence. — An appeal from a noted lawyer.

- Assumptions :**
- Every century should be marked for a particular purpose.
  - The human race is ready to focus its attention on aiming at excellence in every sphere of life.

5. **Statement :** The private bus services in the city has virtually collapsed because of the ongoing strike of its employees.

- Assumptions :**
- Going on strikes has become the right of every employee.
  - People no more require the services of private bus operators.

6. **Statement :** Nobody can predict as to how long our country would take to contain the unfortunate and disastrous terrorist activities.

- Assumptions :**
- It is impossible to put an end to terrorist activities.
  - Efforts to control the terrorist activities are on.

7. **Statement :** You know that your suit is excellent when people ask about your tailor who tailored the suit.

- Assumptions :**
- I. People do not ask about your tailor if your suit is not good.
  - II. The people want to know the criteria of an excellent suit.
- 8. Statement :** Even with the increase in the number of sugar factories in India, we still continue to import sugar.
- Assumptions :**
- I. The consumption of sugar per capita has increased in India.
  - II. Many of the factories are not in a position to produce sugar to their fullest capacity.
- 9. Statement :** Highly brilliant and industrious students do not always excel in the written examination.
- Assumptions :**
- I. The written examination is good mainly for mediocre students.
  - II. The brilliant and industrious students cannot always write good answer in the exam.
- 10. Statement :** The coffee powder of company X is quite better in taste than the much advertised coffee of company Y.
- Assumptions :**
- I. If your product is not good, you spend more on advertisement.
  - II. Some people are tempted to buy a product by the advertisement.
- 11. Statement :** I can take you quickly from Kanpur to Lucknow by my cab but then you must pay me double the normal charges.
- Assumptions :**
- I. Normally, it will take more time to reach Lucknow from Kanpur.
  - II. People want to reach quickly but they will not pay extra money for it.
- 12. Statement :** The civic authority appealed to the people for reduction in usage of water as there may be an acute shortage during the coming weeks.
- Assumptions :**
- I. There will be no rain in recent future.
  - II. The people are ready to follow the advice of the civic authority.
- 13. Statement :** If the city bus which runs between Cheka Naka and Vande Park is extended to Shramnagar, it will be convenient.—Appeal of residents of Cheka Naka to the city bus company.
- Assumptions :**
- I. The convenience of the city bus company is much more important than the needs of the consumers.
  - II. The city bus company is indifferent to the aspirations of the residents of Shramnagar.
- 14. Statement :** When is Manohar's birthday?
- Assumptions :**
- I. Manohar's father was born on 15-8-1947.
  - II. Manohar is 25 years younger to his mother.

- DIRECTIONS (Qs. 15-24) :** In each of following questions, a statement is given followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is implicit. Give answer:
- (a) if only assumption I is implicit.  
 (b) if only assumption II is implicit.  
 (c) if either I or II is implicit.  
 (d) if both I and II are implicit.
- 15. Statement :** The state government 'X' is committed to restrict smoke levels on the roads of the metropolis as per the desired parameters.
- Assumptions :**
- I. It is possible to determine the smoke levels.
  - II. A committed government can carry forward welfare measures for its people.
- 16. Statement :** Unemployment allowance should be given to all unemployed Indian youth above 18 years of age.
- Assumptions :**
- I. There are unemployed youth in India who need monetary support.
  - II. The government has sufficient funds to provide allowance to all unemployed youth.
- 17. Statement :** A Notice Board at a ticket window: 'Please come in queue.'
- Assumptions :**
- I. Unless instructed people will not form queue.
  - II. People any way want to purchase tickets.
- 18. Statement :** The Government of India has decided to start a track II dialogue with its neighbour to reduce tension in the area.
- Assumptions :**
- I. The neighbouring country may agree to participate in the track II dialogue.
  - II. The people involved in track II dialogue may be able to persuade their respective Governments.
- 19. Statement :** The X-Airlines has temporarily suspended flights to a few destinations for the next four days due to the strike call given by the Pilots' Association.
- Assumptions :**
- I. The airlines may be able to restore all the flights after four days.
  - II. The Pilots' Association may withdraw the strike call within four days.
- 20. Statement :** Try to steal this camera from our store — a display on a departmental store.
- Assumptions :**
- I. People want to own a camera.
  - II. The store has a video monitoring system to detect stealing.
- 21. Statement :** Never before such a lucid book was available on the topic.
- Assumptions :**
- I. Some other books were available on this topic.
  - II. You can write lucid books on very few topics.

22. Statement : "Get rid of your past for future, get our new-generation fridge at a discount in exchange of old". — An advertisement.	27. Statement : In view of the recent spurt in sugar prices in the open market, the government has asked the dealers to release a vast quantity of imported sugar in the open market.
Assumptions : I. The sales of the new fridge may increase in the coming months. II. People prefer to exchange future with past.	Assumptions : I. The dealers will follow the government directive. II. The sugar prices will come down. III. The price of indigenous sugar will remain unchanged.
23. Statement : The party president has directed that no member of the party will give press briefing or interviews to government and private T.V. channels about the discussion in scheduled meeting of the party.	(a) Only I and II are implicit. (b) Only II and III are implicit. (c) Only I and III are implicit. (d) None is implicit.
Assumptions : I. Party members will observe this directive of the president. II. The general public will not come to know about the happenings in the scheduled meeting of the party.	DIRECTIONS (Qs. 28-30) : Each of the questions below has a statement followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. Consider the statement and the assumptions following it, in each of these questions and mark your answer as (a) if the assumption I is implicit. (b) if the assumption II is implicit. (c) if neither I nor II is implicit. (d) if both I and II are implicit.
24. Statement : The end of a financial year is the ideal time to take a look at the performance of various companies.	28. Statement : Despite heavy rains, traffic has not been disturbed.
Assumptions : I. All the companies take such a review at the end of a financial year. II. The performance data of various companies is available.	Assumption : I. Rains do not affect traffic movement. II. Adequate precautions were taken for traffic management during the rainy season.
DIRECTIONS (Qs. 25-27) : In each of following questions, a statement is given followed by three assumptions numbered I, II and III. Consider the statement and the following assumptions and decide which of the assumptions is implicit.	29. Statement : Many historians have done more harm than good by distorting truth.
25. Statement : "We have the distinction of being the only company in India as well as the second in the world to have won an ISO-9002 quality certification in our line of business" — Statement of company X's Chairman.	Assumption : I. People believe what is written in the history books. II. Historians are seldom expected to depict the truth.
Assumptions : I. There were not many companies in the line of business of Company 'X'. II. Getting ISO-9002 in the line of business of Company 'X' is not easy. III. The company 'X' desires to expand its business.	30. Statement : It is not always true that adoption of sophisticated technology increases production efficiency.
(a) Only I is implicit. (b) Only II is implicit. (c) Only III is implicit. (d) Only II and III are implicit.	Assumption : I. Adoption of sophisticated technology is not difficult thing to achieve. II. Production efficiency can be achieved by getting rid of sophisticated technology.
26. Statement : India's economic growth has come at a terrible price of increased industrial and vehicular pollution.	DIRECTIONS (Qs. 31-35) : A statement is followed by three assumptions marked I, II and III. Check whether these assumptions are implicit in the statement or not. Possible combinations of assumptions are given against options (a), (b), (c) and (d). Choose the appropriate one.
Assumptions : I. Pollution is a part of industrial society. II. Indian economic growth is based on only industrial growth. III. A country desires economic growth with manageable side-effects.	31. Statement : "Buy pure and natural honey of company X" — an advertisement in a newspaper.
(a) Only I is implicit. (b) Only II is implicit. (c) Only I and III are implicit. (d) Only III is implicit.	Assumptions : I. Artificial honey can be prepared. II. People do not mind paying more for pure and natural honey. III. No other company supplies pure honey.
	(a) Only I is implicit (b) Only I and II are implicit (c) Only I and III are implicit (d) All are implicit

- 32. Statement :** "Fly with us and experience the pleasure of flying"—an advertisement by an airline.
- Assumptions :**
- I. More passengers may be attracted to travel by the airline after reading the advertisement.
  - II. People generally may prefer an enjoyable flight.
  - III. Other airlines may not be offering the same facilities.
- (a) None is implicit  
 (b) Only I is implicit  
 (c) Only II is implicit  
 (d) None of these
- 33. Statement :** "We do not want you to see our product in newspaper, visit our shop to get a full view"—an advertisement.
- Assumptions :**
- I. People generally decide to purchase any product after seeing the name in the advertisement.
  - II. Uncommon appeal may attract the customers.
  - III. People may come to see the product.
- (a) None is implicit  
 (b) Only I and II are implicit  
 (c) Only II and III are implicit  
 (d) All are implicit
- 34. Statement :** "Use Riya cold cream for fair complexion"—an advertisement.
- Assumptions :**
- I. People like to use cream for fair complexion.
  - II. People are easily fooled.
  - III. People respond to advertisements.
- (a) Only I is implicit  
 (b) Only I and II are implicit  
 (c) Only II is implicit  
 (d) Only I and III are implicit
- 35. Statement :** "Smoking is injurious to health"—a warning printed on the cigarette packets.
- Assumptions :**
- I. People read printed matter on the cigarette packet.
  - II. People take careful note of warning.
  - III. Non-smoking promotes health.
- (a) Only I is implicit  
 (b) Only I and II are implicit  
 (c) Only II is implicit  
 (d) All are implicit
- DIRECTIONS (Qs. 36 -38) :** In each question, a statement is followed by two assumptions numbered I and II. Consider the statement and the following assumptions to decide which of the assumptions is implicit in the statement. Mark answer as
- (a) if only assumption I is implicit;  
 (b) if either I or II is implicit;  
 (c) if only assumption II is implicit;  
 (d) if neither I nor II is implicit.
- 36. Statement :** Like a mad man, I decided to follow him.
- Assumptions :**
- I. I am not a mad man.  
  - II. I am a mad man.
- 37. Statement :** All the employees are notified that the organisation will provide transport facilities at half the cost from the nearby railway station to the office except those who have been provided with travelling allowance.
- Assumptions:**
- I. Most of the employees will travel by the office transport.
  - II. Those who are provided with travelling allowance will not read such notice.
- 38. Statement :** An advertisement of a Bank "Want to open a bank account! Just dial our 'room service' and we will come at your doorsteps."
- Assumptions:**
- I. There is a section of people who require such service at their home.
  - II. Now-a-days banking has become very competitive.
- DIRECTIONS (Qs. 39-41) :** In each of these questions, there is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions to decide which of the assumptions is implicit in the statement. Give your answer as :
- (a) if only assumption I is implicit  
 (b) if only assumption II is implicit  
 (c) if either I or II is implicit  
 (d) if neither I nor II is implicit
- 39. Statement :** The civic authority appealed to the people for reduction in usage of water as there may be an acute shortage during the coming weeks.
- Assumptions:**
- I. There will be no rain in the immediate future.
  - II. The people are ready to follow the advice of the civic authority.
- 40. Statement :** Government has permitted unaided colleges to increase their fees.
- Assumptions:**
- I. Unaided colleges are in financial difficulties.
  - II. Aided colleges do not need to increase fees.
- 41. Statement :** The government is making efforts to boost tourism in Jammu and Kashmir.
- Assumptions:**
- I. Tourism in Jammu and Kashmir dropped following political unrest.
  - II. Special discounts in the air fare have been announced.
- DIRECTIONS (Qs. 42-45) :** Each of these has a statement followed by two assumptions. Mark answer as:
- (a) if only assumption I is implicit;  
 (b) if only assumption II is implicit;  
 (c) if either I or II is implicit;  
 (d) if neither I nor II is implicit.
- 42. Statement :** Unemployment allowance should be given to all unemployed Indian youth above 18 years of age.
- Assumptions :**
- I. There are unemployed youth in India who need monetary support.
  - II. The government has sufficient funds to provide allowance to all unemployed youth.

43. Statement :	All the employees are notified that the organization will provide transport facilities at half cost from the nearby railway station to the office except those who have been provided with travelling allowance.	49. Statement :	Take this 'oven' home and you can prepare very tasty dishes which you were unable to prepare earlier—An advertisement of X brand oven.
Assumptions :	I. Most of the employees will travel by the office transport. II. Those who are provided with travelling allowance will not read such notice.	Assumptions :	I. The user knows the procedure recipe of tasty dishes but does not have the proper oven to cook. II. Only 'X' brand oven can cook very tasty dishes.
44. Statement :	Retired persons should not be appointed for executive posts in other organizations.	50. Statement :	Who rises from the prayer a better man, his prayer is answered.
Assumptions :	I. Retired persons may lack the zeal and commitment to carry out executive's work. II. Retired persons do not take interest in the work and welfare of the new organizations.	Assumptions :	I. Prayer makes a man more human. II. Prayer atones all of our misdeeds.
45. Statement :	Government aided schools should have uniformity in charging various fees.	<b>DIRECTIONS (Qs. 51-54) :</b> A statement is followed by two assumptions numbered I and II. Consider the statement and the assumptions together. Decide which assumption is implicit in the statement. Mark answer as	
Assumptions :	I. The government's subsidy comes from the money collected by way of taxes from people. II. The government while giving subsidy may have stipulated certain uniform conditions regarding fees.	<p>(a) If either assumption I or II is implicit          (b) If only assumption II is implicit          (c) If only assumption I is implicit          (d) If neither assumption I nor II is implicit</p>	
46. Statement :	The KLM company has decided to go for tax-free and taxable bonds to raise its resources.	51. Statement :	A notice : "Use of cell phones and pagers is not allowed inside the auditorium. Please switch off such devices while you are inside the auditorium".
Assumptions :	I. The KLM company has already explored other sources to raise money. II. The products of KLM company have little competition in the market.	Assumptions :	I. All those who have such devices will switch them off before they take their seat in the auditorium. II. Generally people do not bring such devices when they come to attend functions in the auditorium.
47. Statement :	It is felt that when the airline is facing stiff competition coupled with a precarious financial position, the top level posts should be kept open for outside professionals than internal candidates.	52. Statement :	An advertisement : "Fly X airways whenever you decide to go places. Our fares are lesser than train fares."
Assumptions :	I. Internal candidates aspire only getting promotions, without much contribution. II. Experienced professionals are more likely to handle the problems of the airline.	Assumptions :	I. People prefer to travel by air when the fares are reasonable. II. The fares of other airlines are costlier than those of X airways.
48. Statement :	Lack of stimulation in the first four-five years of life can have adverse consequences.	53. Statement :	Dengue cannot be eradicated from our city unless we create a special 'Health-squad' for it.
Assumptions :	I. A great part of the development of observed intelligence occurs in the earliest years of life. II. 50 percent of the measurable intelligence at the age of 17 is already predictable by the age of four.	Assumptions :	I. Dengue is harmful. II. Creating Health-squad is impossible.
49. Statement :	A warning : "Do not smoke in public places as it is a cognizable offence in our country."	54. Statement :	A warning : "Do not smoke in public places as it is a cognizable offence in our country."
Assumptions :	I. People often neglect such warnings. II. People do not understand the implications of committing a cognizable offence.	Assumptions :	I. People often neglect such warnings. II. People do not understand the implications of committing a cognizable offence.

# SOLUTIONS

1. (b) No deduction can be made regarding other companies. So, I is not implicit. Since one is advised to contact the company's lawyer in case of any problem, it means that the lawyer is fully acquainted with the case. So, II is implicit.
2. (a) The statement mentions that there is no problem if one comes upto 7 p.m. also. This is clearly deduced that the programme will continue even after 7 p.m. So, I is implicit. Also, it is clearly mentioned that the programme will start at 6 p.m. So, II is not implicit.
3. (b) I is not implicit. The statement puts it the other way round. That is, health results in happiness. It can be inferred that people desire to be happy, prosperous and virtuous from II. Hence it is implicit.
4. (b) I is not implicit as it is not clear from the statement. II is implicit from the tone of the lawyer's statement as the human race is aiming at achieving excellence in life.
5. (d) Since both the assumptions do not follow from the given statement, so neither I nor II is implicit.
6. (b) I is not implicit. In fact, the statement suggests it is possible to contain terrorist activities. What is disputed is "how long". But II is implicit. The action has begun, though its end is not in sight.
7. (a) The statement mentions that if the people ask about the tailor, your suit is good. This means that people ask only in the situation when the thing is good. So, I is implicit. The criteria of an excellent suit is not mentioned. So, II is not implicit.
8. (c) Clearly, the need to import sugar could be either due to increase in consumption or the inefficiency of the factories to produce sugar to their fullest capacity. So, either I or II is implicit.
9. (b) What we are being told about brilliant students does not have anything to do with mediocre students. Hence I is not implicit. But II is implicit. This must be the reason why the brilliant students do not always excel.
10. (b) I is not implicit as the company with a bad product might be advertising more because people are not aware of it. According to the statement, the product of company Y is more known because of more advertisement. So, II is implicit.
11. (a) Since the narrator asks for double charges to take the person quickly to Lucknow, it implies that normally it takes more time to reach Lucknow. So, I is implicit. Since one demands extra charges to reach the destination earlier than usual, the person in need would have to pay accordingly. So, II is not implicit.
12. (b) Clearly, I is not directly related to the issue in the given statement and so is not implicit. The civic authority makes an appeal to the people with the hope that it would surely be attended to by the people. So, II is implicit.
13. (d) We are in no position to pass any judgment at present. We may assume these only if the appeal is rejected. So, neither I nor II is implicit.
14. (d) Manohar's age has no relation to the age of his father. Therefore A is not implicit. Also, the age of Manohar's mother is not given. Then, B is also not implicit.
15. (d) The govt. has promised to bring down the smoke level because it is possible to determine the level. Hence I is implicit. II is implicit because containing pollution is also a welfare measure.
16. (a) I directly follows from the statement and so is implicit. Also, the statement is a suggestion and does not tell about a government policy or its position of funds. So, II is not implicit.
17. (d) The instructions have been given so that people willing to buy tickets may not form a crowd. So, I is implicit. Also, it is clear that people would purchase the tickets even after following the given instructions. So, II is also implicit.
18. (d) A decision to start any short of dialogue with one's neighbour assumes that the neighbour will also participate in it. Hence I is implicit. II is implicit because track II dialogue can be meaningful only when the respective Govts agree to abide by it.
19. (c) Why has the suspension of flights been made for a limited period of four days? It must have been assumed by the authorities of X-Airlines that the crisis may be over after this limited period. It is also possible that the Pilots' Association may withdraw the strike call within four days.
20. (b) Clearly, the owner of the store warn that one dare not try to steal the camera. So, only II is implicit while I is not.
21. (a) It follows from the statement that books on this topic were available before also but they were not 'lucid'. So, I is implicit. But a general comment as II cannot be made from the given statement. So, II is not implicit.
22. (d) Assumption I is implicit. Why has such advertisement been published by the advertisers? Definitely, the advertiser is assuming the sales to pick up. II is also implicit; that is why advertiser advocates doing so.
23. (a) Clearly, the party president lays down the policies for its members. So, I is implicit. From the statement we

- cannot certainly assumed that the general public will not come to know about the happening in the scheduled meeting of the party.
24. (b) From the statement we cannot say about all the companies. Hence it is not implicit. Since the end of financial year is the ideal time to take a look at the performance of various companies, so the performance data of various companies must be available.
25. (d) Since it is hard to get ISO-9002 certification, he is trying to highlight company's achievement and by doing that expansion of his business is in his mind.
26. (c) I is implicit in the phrase "industrial ... pollution." II is not implicit because of the word 'only'. III is implicit from the concern shown at the "terrible price".
27. (a) The government's decision is clearly a measure to increase supply and control rates. So, both I and II are implicit, while III is not.
28. (b) I is not implicit. Despite .... disturbed, implies that rains do affect the traffic movement. Traffic has remained undisturbed implies that adequate precautions were taken for traffic management during the rainy season.
29. (a) Very fact that historians have done more harm than good by distorting truth implies that people believe what is written in the history books.
30. (c) Both the assumptions are not valid. If sophisticated technology can give increase production efficiency then what is meaning of statement- '.....not always.....'
31. (a) From the statement it is obvious that people give preference to pure and natural honey, hence the company X is mentioning it in the advertisement.
32. (d) Both I and II are implicit. If people did not want enjoyable flight, there would have no meaning of this kind of advertisement. Advertisement is given for attraction of people.
33. (c) Uncommon way of advertisement arouses interest in the customers, hence people may visit the shop out of curiosity.
34. (d) People like to use, cream for fair complexion and they respond to advertisements.
35. (b) People usually read the printed matter on the cigarette packet and they take careful note of the warning, hence the warning printed on the packet.
36. (a) The use of like a man indicates that the man concerned is not mad.
37. (d) It is not clear, how many employees are getting travelling allowance, so I is not implicit. The statement barring employees getting travelling allowance indicate that most people will read the notice.
38. (a) Banks' willingness to go to customer's doorstep makes statement I implicit. There is no information regarding number of banks or business volume of the market, hence statement II is not implicit.
39. (d) None of the given assumptions is implicit in the statement.
40. (a) Only assumption I is implicit in the statement. While assumption II is not directly relevant to given statement.
41. (b) I is not directly relevant to given statement so, it is not implicit. II is a way to encourage tourism in Jammu and Kashmir.
42. (a) Assumption I is implicit for the given statement. It is true that there are unemployed youths in India who need monetary support, but it may not be true that government has sufficient funds to provide allowance to all these unemployed youths.
43. (d) Both of the given assumptions are not implicit for the given statement.
44. (d) Both of the given assumptions are not followed by the given statements.
45. (b) Assumption II is implicit for the given statement.
46. (d) Assumption I cannot be correlated with the statement. Hence assumption I is not implicit. From tax-free and taxable bond of any company, we cannot be concluded that company have little competition in the market.
47. (a) I is not implicit. There is no hint regarding internal candidates aspire only getting promotion, without much contribution. II can be assumed because outside professionals will be more experienced than internal candidates.
48. (b) Given statement indicates that development of intelligence is more suitable in the earliest years of life so I is implicit. II is not correlated with the statement. So it is not implicit.
49. (d) From statement we cannot assume that user knows the procedure recipe of tasty dishes. So I is not implicit. II is not implicit because 'X' brand oven can cook very tasty and not only 'X' brand.
50. (b) From the term 'better man', it is clear that the speaker is assuming that prayer makes a man more human.
51. (c) Assumption II is not implicit. If people do not bring such devices, then why did they need of this notice? Meaning of any notice is that the people will obey it. Hence only I is implicit.
52. (c) Definitely, people prefer to travel by air when the fares are reasonable. It is clear from advertisement— 'our fares are lesser than train fares.' Assumption II is not implicit because fares of other airways are not given.
53. (c) If Dengue is not harmful then what is the need of eradication? Assumption II is not directly relevant to statement.
54. (d) Both assumptions contradict the statement. Hence neither assumption I nor II is implicit.

# 20

## CHAPTER

# STATEMENT AND ARGUMENTS

In these questions, a statement related to a Political, Social or Economic issue is given, followed by two arguments. Generally, both the arguments are contrary to each other. We have to analyse the statement and the arguments and then decide which of the arguments holds strong.

**What is the difference between 'strong' and 'weak' arguments?**  
A strong argument is that which touches the practical and real aspect of the situation as described in the statement. A 'strong' argument should give the realistic diagnosis of the situation described in the statement. Also 'strong' arguments must be both important and directly related to the statement.

A weak argument is very simple, superfluous and ambiguous. 'Weak' arguments may not be directly related to the statement and may be of minor importance or may be related to the trivial aspect of the given statement.

**Direction (for Examples 1 to 5) :** Each of the following questions consists of a statement followed by two arguments I and II. Give answer :

- (a) If only argument I is strong;
- (b) If only argument II is strong;
- (c) If either I or II is strong;
- (d) If neither I nor II is strong;

### Example 1 :

**Statement :** Should polythene bags be banned in India?

**Arguments :**  
I. No. The polythene bags are very cheap and are very convenient.  
II. Yes. That is what many countries are doing.

### Solution :

- (a) A economic advantage and user-friendliness are strong reasons. Hence I is strong. II is weak because it is tantamount to following other countries blindly.

### Example 2 :

**Statement :** Should women be given equal opportunity in matter of employment in every field?

**Arguments :**  
I. Yes. They are equally capable.  
II. No. They have to shoulder household responsibilities too.

### Solution :

- (d) It has not mentioned how women are equally capable. Hence I is weak. Household responsibilities can be equally shared by men and women. Hence II is weak.

### Example 3 :

**Statement :** Should metropolitan corporations be changed to public limited companies to enhance their efficiency and reduce expenditure?

**Arguments :**  
I. Yes. It will bring in commercial management and citizens would expect good service at reasonable rates.  
II. No. It will end the local elections because there will be no elected corporator.

### Solution :

- (a) Since public limited companies are established to run government organisations on business lines, I is strong. Good service is more important than elections. Hence II is weak.

### Example 4 :

**Statement :** Should fashionable dresses be banned?

**Arguments :**  
I. Yes. Fashions keep changing and hence consumption of cloth increases.  
II. No. Fashionable clothes are a person's self-expression and therefore his/her fundamental right.

### Solution :

- (b) Clearly, imposing ban on fashionable dresses will be a restriction on the person choice and hence the right to freedom of an individual. So, only argument II is strong.

### Example 5 :

**Statement :** Is monarchy better than democracy?

**Arguments :**  
I. Yes. If the chair has one confirmed ruler, there are no ambitious aspirants fighting for it.  
II. No. People are more contented and happy in democracy.

### Solution :

- (d) Clearly, the success of a government does not rest on the firmness of its claim to the chair but depends on its outlooks and policies. So, argument I is not strong enough. Argument II is also vague because a democracy is coveted for the reason that in it, the voice of the people is above all.

## EXERCISE

**DIRECTIONS (Qs. 1-13) :** Each of the following questions consists of a statement followed by two arguments I and II. Give answer :

- (a) If only argument I is strong;
- (b) If only argument II is strong;
- (c) If either I or II is strong;
- (d) If neither I nor II is strong;
- (e) If both I and II are strong

**1. Statement :** Should there be a restriction on the migration of people from one state to another in India?

**Arguments :**

- I. No. Any Indian citizen has a basic right to stay at any place of their choice and hence they cannot be stopped.
- II. Yes. This is the way to effect an equitable distribution of resources across the states in India.

**2. Statement :** Should seniority be the only criterion for the promotion?

**Arguments :**

- I. No. All the senior employees are not interested in promotion.
- II. Yes. Otherwise senior employees feel humiliated.

**3. Statement :** Should promotions in the armed forces be made on the basis of seniority?

**Arguments :**

- I. No. Patriotism is the most important attribute for such promotions.
- II. No. It would be an injustice to those juniors who are more deserving and suitable for higher positions.

**4. Statement :** Should Slum-dwellers be provided free houses in big cities and metropolises?

**Arguments :**

- I. No. Most of the slum dwellers are poor and illiterate.
- II. Yes. Providing food and shelter to every citizen is the responsibility of any welfare state.

**5. Statement :** Should government stop spending huge amounts of money on international sports?

**Arguments :**

- I. Yes. This money can be utilised for upliftment of the poor.
- II. No. Sportspersons will be frustrated and will not get international exposure.

**6. Statement :** Should Government 'freeze' pay-scales and salary of all private and public sectors and its own employees to contain inflation?

**Arguments :**

- I. Yes. All over the world this is considered as a sure way to contain inflation.
- II. No. The government should control market forces to keep check on the prices.

**7. Statement :** Should students union in universities be abolished?

**Arguments :**

- I. Yes. Students can pay full attention to their career development.
- II. No. All the great leaders had been student's union leaders.

**8. Statement :** Should the government levy tax on agricultural income also?

**Arguments :**

- I. Yes. That is the only way to fill government coffers.
- II. No. Eighty per cent of our population live in rural areas.

**9. Statement :** Should there be capital punishment for those who are found guilty of rape charges?

**Arguments :**

- I. Yes. This is the only way to eliminate such atrocities on women.
- II. No. This will lead to more violence as culprits may even kill the rape victims.

**10. Statement :** Should there be a complete ban on use of pesticides in agricultural sector?

**Arguments :**

- I. Yes. This is the only way to save the underground water from getting polluted with such dangerous chemicals.
- II. No. This will adversely affect the agricultural production.

**11. Statement :** Should Indian scientists working abroad be called back to India?

**Arguments :**

- I. Yes. They must serve the motherland first and forget about discoveries, honours, facilities and all.
- II. No. We have enough talent, let them stay where they want.

**12. Statement :** Should the habit of late-coming in educational institutions be checked?

**Arguments :**

- I. No. Until it affects the work.
- II. Yes. Discipline must be maintained.

**13. Statement :** Should we scrap the 'Public Distribution System' in India?

**Arguments :**

- I. Yes. Protectivism is over, everyone must get the bread on his/her own.
- II. Yes. The poor do not get any benefit because of corruption.

**DIRECTIONS (Qs. 14-25) :** Each of the following questions consists of a statement followed by two arguments I and II. Give answer :

- (a) If only argument I is strong;
- (b) If only argument II is strong;
- (c) If either I or II is strong;
- (d) If both I and II are strong.

- 14. Statement :** Should high chimneys be installed in industries?  
**Arguments :**
  - I. Yes. It reduces pollution at ground level.
  - II. No. It increases pollution in upper atmosphere.
- 15. Statement :** Should there be only one rate of interest for term deposits of varying durations in banks?  
**Arguments :**
  - I. No. People will refrain from keeping money for longer duration resulting into reduction of liquidity level of banks.
  - II. Yes. This will be most simple for the common people and they may be encouraged to keep more money in banks.
- 16. Statement :** Should the prestigious people be met with special treatment by law if they have committed crime unknowingly?  
**Arguments :**
  - I. Yes. Because the prestigious people do not commit crime intentionally.
  - II. No. It is our policy that everybody is equal before the law.
- 17. Statement :** Should all the utility services be immediately brought under essential services to avoid frequent agitation and strikes by the employees?  
**Arguments :**
  - I. No. Otherwise how the employees may voice their grievances and demands?
  - II. Yes. The employees are becoming more and more greedy and they take the general public for ride by striking work.
- 18. Statement :** Should the tuition fees in all Post-Graduate courses be hiked considerably?  
**Arguments :**
  - I. Yes. This will bring in some sense of seriousness among the students and will improve the quality.
  - II. No. This will force the meritorious poor students to stay away from Post-Graduate courses.
- 19. Statement :** Should judiciary be independent of the executive?  
**Arguments :**
  - I. Yes. This would help curb the unlawful activities of the executive.
  - II. No. The executive would not be able to take bold measures.
- 20. Statement :** Should system of offering jobs only to wards of government employees be introduced in all government offices in India?  
**Arguments :**
  - I. No. It denies opportunity to many deserving individuals and government may stand to loose in the long run.
  - II. No. It is against the principle of equality and does government not own responsibility to all its citizens?
- 21. Statement :** Should school education be made free in India?  
**Arguments :**
  - I. Yes. This is the only way to improve the level of literacy.
  - II. No. It would add to the already heavy burden on the exchequer.
- 22. Statement :** Should internal assessment in colleges be abolished?  
**Arguments :**
  - I. Yes. This will help in reducing the possibility of favouritism.
  - II. No. Teaching faculty will lost control over students.
- 23. Statement :** Should non-vegetarian food be totally banned in our country?  
**Arguments :**
  - I. Yes. It is expensive and therefore it is beyond the means of most people in our country.
  - II. No. Nothing should be banned in a democratic country like ours.
- 24. Statement :** Should public holidays be declared on demise of important national leaders?  
**Arguments :**
  - I. No. Such unscheduled holidays hamper national progress.
  - II. Yes. People would like to pay their homage to the departed soul.
- 25. Statement :** Should the existing labour laws be changed in the favour of owners?  
**Arguments :**
  - I. Yes. The existing labour laws give much more protection to employees than required and thus production is reduced.
  - II. No. Because owners would exploit employees as before when there were no labour laws.

**DIRECTIONS (Qs. 26-29) :** Each of the questions below consists of a statement followed by two arguments I and II. Decide which of the arguments is a 'strong argument' and which is a 'weak' argument. Mark your answer as

- if only argument I is strong.
  - if only argument II is strong.
  - if neither I nor II is strong.
  - if both I & II are strong.
- 26. Statement :** Should Central Government open well-equipped hospitals for every subdivision of every district?  
**Arguments :**
  - I. Yes, Health and well-being of every citizen is the primary responsibility of the government.
  - II. No, it is not possible, society must come forward to help the government.
- 27. Statement :** Should articles of only deserving author allowed to be published ?  
**Arguments :**
  - I. Yes, it will save a lot of paper which is in short supply.
  - II. No, it is not possible to draw a line between the deserving and the undeserving.

28. Statement : Does India need so many plans for development.	Arguments : I. Yes, nothing can be achieved without proper planning. II. No, too much time, money and energy is wasted on planning.	34. Statement : Should there be only one rate of interest for term deposits of varying durations in banks?	Arguments : I. No, people will refrain money for longer duration resulting into reduction of liquidity level of banks. II. Yes, this will be much simpler for the common people and they may be encouraged to keep more money in banks.
29. Statement : Should cutting of trees be banned altogether.	Arguments : I. Yes, it is very much necessary to do so to restore the ecological balance. II. No, A total ban would harm the timber-based industries.	35. Statement : Should mutual funds be brought under strict Govt. control?	Arguments : I. Yes, that is one of the ways to protect the interest of the investors. II. No, strict Govt. controls are likely to be counter productive.
<b>DIRECTIONS (Qs. 30-33) :</b> Each of these questions is followed by two arguments numbered I and II. Mark answer as :		36. Statement : Should all the profit making public sector units be sold to private companies?	Arguments : I. Yes, this will help the government to augment its resources for implementing the development programmes. II. No, the private companies will not be able to run these units effectively.
(a) If only argument I is strong (b) If either I or II is strong (c) If only argument II is strong (d) If neither I or II is strong		37. Statement : Should the public sector undertakings be allowed to adopt hire and fire policy?	Arguments : I. Yes, this will help the public sector undertakings to get rid of non-performing employees and will also help to reward the performing employees. II. No, the management may not be able to implement the policy in an unbiased manner and the employees will suffer due to the high-handedness of the management.
30. Statement : Should those who manufacture spurious life saving drugs be given capital punishment?	Arguments : I. No, nobody has the right to take people's life as we cannot give life to anybody. II. Yes, those people are more dangerous than those who are convicted for homicide as the extent of damage to human life is incalculable.	<b>DIRECTIONS (Qs. 38-41) :</b> Each of these has a question followed by two arguments numbered I and II. Decide which of the arguments is 'strong' and which is 'weak'. Mark answer as	
31. Statement : Should there be a restriction on number of ministers in each cabinet in India?	Arguments : I. Yes, as a result of this a lot of money will be saved and the same can be used in developmental programmes. II. No, there should not be such restrictions on democratically elected representatives and it should be left to the judgement of the leader of the council of ministers.	(a) if only argument II is strong. (b) if only argument I is strong. (c) if either argument I or II is strong. (d) if neither argument I nor II is strong.	
32. Statement : Should the press in India be given full freedom?	Arguments : I. Yes, because only then people will become politically enlightened. II. No, because full freedom to press will create problems.	38. Statement : Should all the professional colleges in India be encouraged to run their own courses without affiliation to any university?	Arguments : I. Yes, this is the only way to create more opportunities for those who seek professional training. II. No, this will dilute the quality of professional training as all such colleges may not be equipped to conduct such courses.
33. Statement : In India, should income tax be abolished?	Arguments : I. Yes, because it is an unnecessary burden on the wage earners. II. No, because it is a good source of revenue.	39. Statement : Should all those who have come in contact with the patients of infectious respiratory disease be quarantined in their houses?	Arguments : I. No, nobody should be quarantined unless they are tested and found to be infected by the virus causing the disease. II. Yes, this is the only way to control the spread of the dreaded disease.
<b>DIRECTIONS (Qs. 34-37) :</b> Each of these questions are followed by two arguments numbered I and II. Decide which of the arguments is a 'strong' argument and which is a 'weak' argument. Mark answer as			
(a) If only argument II is strong. (b) If only argument I is strong. (c) If either argument I or II is strong. (d) If neither argument I nor II is strong.			

40. Statement: Should India support all the international policies of United States of America?

Arguments : I. No, many other powerful countries do not support the same.  
II. Yes, this is the only way to gain access to US development funds.

41. Statement: Should there be a complete ban on advertising of tobacco products in all media?

Arguments : I. Yes, this is the only way to save people from suffering from cancer.  
II. No, this will adversely affect the sale of tobacco products.

## SOLUTIONS

1. (e) I is strong on the basis of Constitutional right. II is also strong because it advocates the way to effect an equitable distribution of resources across the states of India.
2. (d) I is not strong because the question of criterion arises only when the employee is really for promotion. II is not strong because a blind submission to such a feeling will do no good to the organisation. The effort should be to take measures that make employees feel that they are being cared for even though not promoted.
3. (b) I is not strong because promotion should be based on different factors which evaluate the efficiency of an individual. Patriotism may be one of the factors but one's efficiency can't depend the most on this factor. II is strong because it advocates for efficient person who must not be ignored.
4. (d) I is weak. On the contrary, poverty and illiteracy should induce us to bestow favour upon slum-dwellers. II is weak because the question here is not only providing shelter but providing it free.
5. (b) Clearly, spending money on sports cannot be avoided merely because it can be spent on socio-economic problems. So, argument I does not hold. Also, if the expenses on sports are curtailed, the sportsperson should face lack of facilities and training and our country will lag behind in international sports competitions.
6. (a) Since India is a part of world, whatever is true all over the world should be true for India also. Hence I is strong. But II is weak because it provides an alternative instead of going into the reason.
7. (a) Clearly, abolishing student's union would relieve the students of the unnecessary activities and enable them to concentrate well on study. So, argument I is strong. However, it is not that participation in student's unions only can make one a great leader. So, argument II is vague.
8. (d) Clearly, earning revenue is not the only criteria on which tax is imposed and also, there are several other ways to add to government treasury. So, argument I is vague. Moreover, a tax cannot be curtailed just because a greater part of the population has to pay it. So, argument II is also not valid.
9. (b) I is weak because it is not true. Is it the only way? Second is correct on logical thinking.
10. (b) Argument I is not correct because of the word 'only' used in the argument. Hence, argument I is not strong. Argument II is strong because adverse impact on agriculture will debilitate the backbone of the economy.
11. (d) I is not strong. The individual's demands are as important as the motherland's. II is weak because of its complacent attitude.
12. (b) I is not strong because instead of giving a reason, it adds a further clause. II is strong because discipline plays a major role in an educational institution.
13. (d) The Public Distribution System is indeed necessary to provide basic amenities to the economically backward sections of population. So, argument I is vague. Also, if the objectives of a system are not fulfilled because of corruption, then getting rid of the system is not solution. Instead, efforts should be made to end corruption and extend its benefits to the people for which it is meant. So, argument II is also not valid.
14. (a) Pollution at ground level is the most hazardous in the way of being injurious to human and animal life. So, argument I alone holds valid.
15. (a) I is strong because higher rates attract people to deposit money for longer duration. If there be only one rate of interest for term deposits for varying durations, this will adversely affect deposit of money in bank for longer duration and also the liquidity level of banks. II is not strong because only one rate of interest does not imply an encouragement for more savings.
16. (b) Argument I advocates that prestigious people do not commit crime intentionally. Is it true? Answer is 'No'. Hence, I is a weak argument. Argument II is a strong argument because it is constitutional right that every people is equal before law.
17. (d) I is strong because often the need arises for the employees to voice their demands. II is also strong because the employees are abusing their right.
18. (b) A hike in fees is no means to make the students more serious in studies. So, argument I is vague. However, with the increase in fees, poor meritorious students would not be able to afford post-graduate studies. So, argument II holds.
19. (a) Clearly, independent judiciary is necessary for impartial judgement so that the Executive does not take wrong measures. So, only argument I holds.

20. (d) It would be against of talented candidates. Opportunity should be given to all deserving individuals. Hence I is a strong argument. II is also strong argument because it advocates the human fundamental right.
21. (b) It may be one of the ways not only way. There are several ways which can improve the level of literacy. So, argument I is vague. Also, such a step would require immense funds for providing the necessary facilities to all institutions and lead to financial drain. So, argument II is valid.
22. (a) Abolishing the internal assessment would surely reduce favouritism on personal grounds because the teachers would not be involved in examination system so that they cannot extort personal benefits to anyone. So, argument I holds strong. But, it will not affect the control of teaching faculty on students because still the teachers would be teaching them. So, argument II is vague.
23. (b) Clearly, restriction on the diet of people will be denying their basic human right. So, only argument II holds.
24. (a) Clearly, unscheduled and untimely holidays would naturally cause the work to suffer. So, argument I holds strong. Also, a holiday is not necessary to pay homage to someone. So, argument II is vague.
25. (d) I is strong because we are not in a position to afford less production. II is strong because exploitation of employees is not desirable.
26. (a) Providing infrastructure for good health of the citizens is the primary responsibility of a modern state. Hence I is strong.
27. (b) Only II is strong. How can be possible to draw a line between the deserving and undeserving author.
28. (a) In the light of the achievements of planned development in India, Argument I is strong.
29. (d) Both are strong arguments from the two opposite viewpoints.
30. (c) Argument I is weak because it will encourage spurious life saving drugs manufacturer. II is strong argument because it advocates to save human life. Hence only argument II is strong.
31. (a) Argument I is strong because it will be helpful to save money and progress of country. II is the wrong argument. Hence only argument I follows.
32. (a) Freedom of press can be helpful to understand the people's needs, a situation etc. So I is strong argument. Argument II does not explain that which kind of problems. So it is weak argument.
33. (d) I is weak argument because of the word 'unnecessary'. Argument II has no logic or reasoning. Hence neither I nor II is strong.
34. (d) I is weak argument. It is not correlated with the statement. II is also weak because how can common people be encouraged from one rate of interest.
35. (b) I is strong because it advocates the interest of investors. II is weak because it is wrongly assumed that strict govt. controls are likely to be counter productive.
36. (d) I is weak because public sector units are profit making. II is also weak argument because, how can we say that private companies will not be able to run these units effectively.
37. (c) I is strong because it will be helpful to increase productivity of public sector undertaking. II is also strong because this step will be against of employees. But both steps cannot be taken at the same time. Hence either I or II follows.
38. (a) Argument I is not strong because it is not the only way. II is strong because it advocates the quality of professional training.
39. (b) Argument I is strong because, first those people should be tested who have come in contact with the patients. Then only quarantined if found positive. II is not strong because it may be one of the ways not only way.
40. (d) I is not strong because we should think about India's prospect not other countries. II is also weak argument because many other parameters should be counted before giving nod to such policies.
41. (d) Ban on advertising of tobacco products may be one of the ways to save people suffering from cancer, hence I is not strong. II is also not strong because it favours only for business of tobacco products not the health of common people.

# STATEMENT AND COURSES OF ACTION

In this type of questions, a statement is given followed by two or more decisions in the form of course of action. We have to analyse the statement and then decide which of the courses of action logically follows.

**What is a 'course of action'?**

A 'course of action' is a step or administrative decision taken for improvement or follow-up or further action in regard to the problem, policy etc. on the basis of the information given in the statement. Courses of action should be feasible and should relate with the practical aspect of life.

Mostly, the given statement mentions a problem and the suggested course of action offers a solution. Thus, it is a 'problem-solving situation'. Sometimes, the statement merely gives a fact and the suggested course of action offers a way to improve the situation. Thus, it is a 'fact-follow-up action' situation.

**Remember :** Always assume everything given in the statement to be true and then only choose the correct option among the given ones.

Read the statement and the options very carefully. In such questions generally 2 type of options are given :

**Type A**

- (a) if only I follows;
- (b) if only II follows;
- (c) if either I or II follows;
- (d) if both I and II follow.

**Type B**

- if only I follows
- if only II follows
- if either I or II follows
- if neither I nor II follows

**Directions (for Examples 1 to 4) :** In each of the following questions, a statement is given followed by two courses of action numbered I and II. Decide which of the courses of action logically follows and give answer as :

- (a) if only I follows;
- (b) if only II follows;
- (c) if either I or II follows;
- (d) if both I and II follow.

**Example 1 :**

**Statement :**

Most of the children in India are not able to get education because they get employed to earn livelihood in their childhood.

**Courses of action :** I. Education should be made compulsory for all children up to the age of 14.

II. Employment of children below the age of 14 years should be banned.

**Solution :**

- (d) To educate all children, enforcement of education is necessary. Also, the reason is that they are employed. So, ban on such employment is also needed. Thus, both the courses follow.

**Example 2 :**

**Statement :**

India has been continuously experiencing military threats from its neighbouring countries.

**Courses of action :** I. India should engage in an all-out war to stop the nagging threats.  
II. India should get the neighbours into a serious dialogue to reduce the tension at its borders.

**Solution :**

- (b) War cannot be an answer to such problems, but dialogue can definitely lessen the problem. Engaging in war might bring in new problems and it might not be able to solve the problem at all.

**Example 3 :**

**Statement :**

At least 15 people were killed and many others injured when a bus fell into the river near a bridge.

**Courses of action :** I. The protection walls of the bridge should be made strong enough to avoid such accidents.  
II. The bus driver should be arrested immediately to make necessary inquiry.

**Solution :**

- (d) I is advisable because it will restrict cases of such accident further. II is advisable because that would help know the cause of the accident.

**DIRECTIONS :** In following question a statement is followed by three courses of action numbered I, II and III. Decide which of the three given courses of action logically follows and then give the answer.

- (a) Only either I or II
- (b) Only II and III
- (c) Only I
- (d) None of these
- (e) All the three

**Example 4 :**

Statement:

The Management of School 'M' has decided to give free breakfast from next academic year to all the students in its primary section through its canteen even though they will not get any government grant.

Courses of action : I. The school will have to admit many poor students who will seek admission for the next academic year.

II. The canteen facilities and utensils will have to be checked and new purchases to be made to equip it properly.

III. Funds will have to be raised to support the scheme for years to come.

**Solution :**

- (b) I is redundant in the context of the statement. II and III clearly follow from the statement.

## EXERCISE

**DIRECTIONS (Qs. 1-9) :** In each of the following questions, a statement is given followed by two courses of action numbered I and II. Decide which of the courses of action logically follows and give answer :

- (a) if only I follows
- (b) if only II follows
- (c) if either I or II follows
- (d) if neither I nor II follows

1. Statement : The company 'X' has decided to give 10% increase in salary to its employees from next month.

Courses of action : I. The accounts department will have to prepare new salary statement for all employees before due date.  
II. Employees' association should ask for more rise in the salary considering the market condition.

2. Statement : The meteorological department has predicted good monsoon this year for the tenth consecutive year and this will result in good crop yield.

Courses of action : I. The Government should off-load the stores before harvesting.  
II. The Government should provide chemical fertilisers to farmers immediately.

3. Statement : Most of the development plans develop in papers only.

Courses of action : I. The incharges should be instructed to supervise the field-work regularly.  
II. The supply of paper to such departments should be cut short.

4. Statement : The cinema halls are incurring heavy loss these days as people prefer to watch movies at home on TV than to visit cinema halls.

Courses of action : I. The Cinema halls should be demolished and residential multistorey buildings should be constructed there.

II. The cinema halls should be converted into shopping malls.

Statement : The alert villagers collectively caught a group of dreaded dacoits armed with murderous weapons.

Courses of action : I. The villagers should be provided sophisticated weapons.  
II. The villagers should be rewarded for their courage and unity.

6. Statement : There was waterlogging in the major part of the city due to heavy rain during past few days and the people residing in those areas were forced to shift to other areas.

Courses of action : I. The Government should arrange food and shelter for the displaced people.

II. The fire brigade should be put on high alert to cope with the situation.

7. Statement : The 'M' State Government has decided henceforth to award the road construction contracts through open tenders only.

- Courses of action :** I. The 'M' state will not be able to get the work done swiftly as it will have to go through tender and other procedures.  
II. Henceforth the quality of roads constructed may be far better.
- Statement :** Many private sector banks have reduced interest rate on housing loans in comparison to public sector banks.
- Courses of action :** I. The case should be raised before the regulatory authority for investigation by the public sector banks as they cannot follow such reduction.  
II. Public sector banks must adopt such policy to remain in competition.
- Statement :** The proposed strike by the transporters would paralyse day-to-day life of the people.
- Courses of action :** I. City administrators should engage the transporters successfully in negotiations on their demands in order to pre-empt their strike.  
II. City administrators should arrange for alternative public transportation system during the strike.
- DIRECTIONS (Qs. 10-17) :** In each of the following questions, a statement is given followed by two courses of action numbered I and II. Decide which of the courses of action logically follows and give answer :
- if only I follows
  - if only II follows
  - if either I or II follows
  - if both I and II follows
- Statement :** ABC Ltd. company has decided to launch free education up to class X for the children of its employees from June 2000.
- Courses of action :** I. The company should reduce its other expenditures to save money for the plan.  
II. The company will have to prepare details for the execution of the plan.
- Statement :** The meteorological department has issued a notification forecasting less rainfall during next year's monsoon.
- Courses of action :** I. The farmers should be advised to be ready for the eventuality.  
II. The Government should make arrangement to provide water to the affected areas.
- Statement :** The Asian Development Bank has approved a \$ 285 million loan to finance a project to construct coal ports by Paradip and Madras Port Trusts.
- Courses of action :** I. India should use financial assistance from other international financial organisations to develop such ports in other places.  
II. India should not seek such financial assistance from the international financial agencies.
- Statement :** There are more than 200 villages in the hill area of Uttar Pradesh which are severely damaged due to cyclone and it causes an extra burden of Rs 200 crore on State Government for relief and rehabilitation work.
- Courses of action :** I. People of hill area should be shifted to other safer places.  
II. State Government should ask more financial support from Central Government.
- Statement :** Orissa and Andhra Pradesh have agreed in principle to set up a joint control board for better control, management and productivity of several inter-state multipurpose projects.
- Courses of action :** I. Other neighbouring states should set up such control boards.  
II. The proposed control board should not be allowed to function as such joint boards are always ineffective.
- Statement :** Footpaths of a busy road are crowded with vendors selling cheap items.
- Courses of action :** I. The help of police should be sought to drive them away.  
II. Some space should be provided to them where they can earn their bread without blocking footpaths.
- Statement :** A recent study shows that children below five years die in the cities of the developing countries mainly from diarrhoea and parasitic intestinal worms.
- Courses of action :** I. Governments of the developing countries should take adequate measures to improve the hygienic conditions in the cities.  
II. Children below five years in the cities of the developing countries need to be kept under constant medication.

17. **Statement:** There has been a significant drop in the water level of all the lakes supplying water to the city.

**Courses of action :**

- I. The water supply authority should impose a partial cut in supply to tackle the situation.
- II. The Government should appeal to all the residents through mass media for minimum use of water.

**DIRECTIONS (Qs. 18-21) :** In each of the following question, a statement is followed by three courses of action numbered I, II and III. Decide which of the three given courses of action logically follows and then give the answer.

18. **Statement:** Suicides are on the rise among youths, particularly due to unemployment.

**Courses of action :**

- I. A committee should be made to find out the main cause of the rise in cases of suicide.
- II. People should be discouraged from indulging in love affairs and encouraged to get self-employed.
- III. Parents of wards should be instructed to nurse their wards if they observe that their wards are facing critical circumstances.

(a) All I, II and III      (b) Only I and II  
 (c) Only I and III      (d) None of these

19. **Statement:** Indian Railways are absolutely dependent on government subsidies and lack concentration on transportation activities.

**Courses of action :**

- I. A committee should be constituted to look into the matter.
- II. Railways should explore new areas to generate revenues.
- III. Railways should concentrate on hiving off non-core activities such as design and manufacture of rolling stock, construction, housing etc. to private sectors.

(a) Only I      (b) Only I and II  
 (c) Only II and III      (d) All follow

20. **Statement:** The chairman of the car company announced in the meeting that all trials of its first product – the new car model ‘M’ – are over and company plans to launch its car in the market after six months.

**Courses of action :**

- I. The network of dealers is to be finalised and all legal, financial and other matters in this connection will have to be finalised shortly.

- II. The company will have to make plan for product other than car.
- III. Material, managerial and other resources will have to be in fine tune to maintain production schedule.

(a) Only I and II  
 (c) All the three

21. **Statement:** The Deputy Mayor of city ‘Z’ has proposed to install a plant of mineral water and to supply citizens mineral water bottles at Rs 6 per litre as against Rs 10 per litre being sold by local private companies.

**Courses of action :**

- I. The local private companies of city ‘Z’ will have to close their operation.
- II. The Corporation of city Z will have to provide for losses in this project in its budget.
- III. The tap water scheme of city Z will have to be stopped.

(a) Only I and III      (b) Only I and II  
 (c) Only II and III      (d) None of these

**DIRECTIONS (Qs. 22-28) :** In each of these questions, there is given a statement followed by two courses of action, numbered I and II. You have to assume everything in the statement to be true to decide which of the two suggested courses of action logically follows for pursuing. Mark your answer as

(a) if only I follows,  
 (b) if only II follows,  
 (c) if either I or II follows,  
 (d) if neither I nor II follows.

22. **Statement:** The Minister said that the teachers are still not familiarised with the need, importance and meaning of population education in the higher education system.

They are not even clearly aware about their role and responsibilities in the population education programme.

**Courses of action :**

- I. Population education programme should be included in the college curriculum.
- II. Orientation programme should be conducted for teachers on population education

- 23. Statement :** Financial stringency prevented the state Government from paying salaries to its employees since April this year.
- Course of action :**
- I. The state Government should immediately curtail the staff strength by at least 30%
  - II. The state Government should reduce wasteful expenditure and arrange to pay the salaries of its employees.
- 24. Statement :** One of the problems facing the food processing industry is the irregular supply of raw material. The producers of raw material are not getting a reasonable price.
- Courses of action :**
- I. The government should regulate the supply of raw material to other industries also.
  - II. The government should announce an attractive package to ensure regular supply of raw material for food processing industry.
- 25. Statement :** The officer Incharge of a Company had a hunch that some money was missing from the safe.
- Courses of action :**
- I. He should get it recounted with the help of the staff and check it with the balance sheet.
  - II. He should inform the police.
- 26. Statement :** The government has decided not to provide financial support to voluntary organisations from the next Five-Year Plan and has communicated that all such organisations should raise funds to meet their financial needs.
- Courses of action :**
- I. Voluntary organisations should collaborate with foreign agencies.
  - II. They should explore other sources of financial support.
- 27. Statement :** If the retired professors of the same Institute are also invited to deliberate on restructuring of the organisation, then their contribution may be beneficial to the institute.
- Courses of action :**
- I. Management may seek opinion of the employees before calling retired professors.
- 28. Statement :** II. Management should involve experienced people for the systematic restructuring of the organisation.
- Courses of action :**
- Youngsters are often found staring at obscene posters.
  - I. Children should be punished and penalised if they are found doing so.
  - II. Any display of such material should be banned.
- DIRECTIONS (Qs. 29-33) :** A statement is followed by three courses of Action numbered I, II and III, You have to assume everything in the statement to be true. Decide which Course(s) of Action logically follow(s) for pursuing from the given options marked (a), (b), (c), and (d) :
- 29. Statement :** In one of the worst accidents on railway level crossing, fifty people died when a bus carrying them collided on to a running train.
- Courses of Action :**
- I. The train driver should immediately be suspended.
  - II. The driver of the bus should be tried in court for negligence on his part.
  - III. The railway authority should be asked to man all its level crossings
- (a) None follows      (b) Only I and II follow  
 (c) Only III follows    (d) Only II and III follow
- 30. Statement :** There was a spurt in criminal activities in the city during the recent festival season.
- Courses of Action :**
- I. The police should immediately investigate into the causes of this increase.
  - II. In future, the police should take adequate precaution to avoid recurrence of such situation during the festival season.
  - III. The known criminals should be arrested before any such season.
- (a) None follows      (b) Only I and II follow  
 (c) Only II and III follow    (d) All follow
- 31. Statement :** A mass mortality of shrimps in ponds on the entire andhra coast has recently been reported due to the presence of a virus.

- Courses of Action :**
- I. The water of the ponds affected should immediately be treated for identifying the nature of the virus.
  - II. The catching of shrimps from the ponds should temporarily be stopped.
  - III. The fishermen should be asked to watch for the onset of such phenomenon in nature.
- (a) Only I follows  
 (b) Only I and II follow  
 (c) All follow  
 (d) Only II and III follow
- 32. Statement :** The world will have to feed more than 10 billion people in the next century of whom half will be in Asia and will eat rice as their staple.
- Courses of Action :**
- I. More funds should immediately be allocated for rice research to help ensure adequate supplies.
  - II. The people in Asia should be encouraged to change their food habit.
  - III. The rice should be grown in countries outside Asia to meet the demand.
- (a) Only I and II follow  
 (b) Only II and III follow  
 (c) All follow  
 (d) None follows
- 33. Statement :** If the faculty members also join the strike, then there is going to be a serious problem.
- Courses of Action :**
- I. The faculty members should be persuaded not to go on strike.
  - II. Those faculty members who join the strike should be suspended.
  - III. The management should not worry about such small things.
- (a) None follows  
 (b) Only I follows  
 (c) Only I and II follow  
 (d) Only II and III follow
- 34. Statement :**
- Drinking water supply to New Bombay has been suspended till further orders from Maharashtra Pollution Control Board following pollution of Patalganga river, caused by discharge of effluents from some chemical industries.
- Courses of Action :**
- I. The industries responsible for discharging effluents into the river should be asked to close down immediately.
  - II. The river water should immediately be treated chemically before resuming supply.
  - III. The Pollution Control Board should check the nature of effluents being discharged into the river by industries at regular intervals.
- (a) All follow  
 (b) Only II and III follow  
 (c) Only I follows  
 (d) Only III follows
- 35. Statement :** The Department of Education has recommended that the primary level admission to Government and Government-aided schools should be done purely by random selection and not by admission tests. This is necessitated as the number of admission seekers are much more than the available seats.
- Courses of Action :**
- I. The Government should instruct the private schools also to follow the same practice.
  - II. The Government should set up an independent body to regulate the primary level admissions.
  - III. The schools should be asked to select students only from those who stay in the neighbouring areas of the school.
- (a) None follows  
 (b) Only II and III follow  
 (c) Only I follows  
 (d) Only III follows

**DIRECTIONS (Qs. 34-38) :** Each of these questions has a statement followed by three suggested Courses of Action numbered I, II and III. Assume everything in the statement to be true, and decide which of the given Courses of Action logically follows for pursuing:

- 36. Statement :** The vehicular traffic has increased so much in the recent past that it takes at least two hours to travel between the city and the airport during peak hours.

**STATEMENT AND COURSES OF ACTION**

- Courses of Action :** I. Non-airport bound vehicles should not be allowed to ply on the road connecting the city and the airport.  
 II. The load of vehicular traffic should be diverted through various link roads during peak hours.  
 III. The departure and arrival of flights should be regulated so as to avoid congestion during peak hours.
- (a) Only I follows      (b) Only I and II follow  
 (c) Only II follows      (d) All follow
- 37. Statement :** Due to cancellation of a huge export order for not adhering to the time frame, the company is likely to get into incurring losses in the current financial year.
- Courses of Action :** I. The officer-in-charge of the production should be immediately suspended.  
 II. The goods manufactured for the export order should be sold to other party.  
 III. The company should change its machinery to maintain the time frame.
- (a) None follows      (b) Only I and II follow  
 (c) Only II follows      (d) All follow
- 38. Statement :** A devastating earthquake has ravaged the city killing hundreds of people and rendering many more homeless.
- Courses of Action :** I. The entry of outsiders into the city should be stopped.  
 II. The civic administration should immediately make alternate temporary housing arrangement for the victims.  
 III. The affected people should immediately be shifted to a safer place.
- (a) Only I follows  
 (b) Only III follows  
 (c) Only II and III follows  
 (d) Either II or III follows
- DIRECTIONS (Qs. 39-40) :** In each of these questions, there is given a statement followed by three courses of action numbered I, II and III. You have to assume everything in the statement to be true to decide which of the three given suggested courses of action logically follow for pursuing.
- 39. Statement :** The army has been alerted in the district following floods triggered by incessant rains.
- Courses of Action :** I. Relief to flood-affected people should be arranged.  
 II. Supply of food articles should be arranged.  
 III. Adequate medical facilities should be arranged.
- (a) None follows  
 (b) Only I follows  
 (c) Only II follows  
 (d) All follow
- 40. Statement :** Higher disposal costs encourage those who produce waste to look for cheaper ways to get rid of it.
- Courses of Action :** I. The disposal costs should be made higher.  
 II. The disposal costs should be brought down.  
 III. A committee should be set up to study the details in this respect.
- (a) All follow  
 (b) Only I follows  
 (c) Only II follows  
 (d) Only II and III follow
- DIRECTIONS (Qs. 41-44) :** In each question below is given a statement followed by two courses of action numbered I and II. You have to assume everything in the statement to be true, then decide which of the two given suggested courses of action logically follows for pursuing. Mark answer as :
- (a) If only II follows  
 (b) If only I follows  
 (c) If neither I nor II follows  
 (d) If both I and II follow
- 41. Statement :** Most of the development plans develop in papers only.
- Courses of Action :** I. The officials should be instructed to supervise the field.  
 II. The supply of paper to such departments should be cut short.
- 42. Statement :** A large number of engineering graduates in the country are not in a position to have gainful employment at present and the number of such engineers is likely to grow in the future.

- Courses of action :** I. The government should launch attractive employment generation schemes and encourage these graduates to opt for such schemes to use their expertise and knowledge effectively.
- II. This happened due to proliferation of engineering colleges in the country and thereby lowered the quality of the engineering graduates. Those colleges which are not equipped to impart quality education should be closed down.
- 43. Statement :** The police department has come under a cloud with recent revelations that at least two senior police officials are suspected to have been involved in the illegal sale of a large quantity of weapons from the state police armoury.
- Courses of action :** I. A thorough investigation should be ordered by the State Government to bring out all those who are involved in the illegal sale of arms.
- II. State police armoury should be kept under Central Government's controls.
- 44. Statement :** The Committee has criticized the Institute for its failure to implement a dozen of regular programmes despite an increase in the staff strength and not drawing up a firm action plan for studies and research.
- Courses of action :** I. The broad objectives of the Institute should be redefined to implement a practical action plan.
- II. The Institute should give a report on reasons for not having implemented the planned programmes.
- DIRECTIONS (Qs. 45-46) :** In each of these questions a statement is followed by two courses of action numbered I and II. Assume everything in the statement to be true. Decide which of the suggested courses of action logically follow(s) for pursuing. Mark answer as
- If only course of action I follows
  - If neither course of action I nor II follows
  - If only course of action II follows
  - If both courses of action I and II follow.
- 45. Statement :** The availability of imported fruits has increased in the indigenous market and so the demand for indigenous fruits has been decreased.
- Courses of Action :** I. To help the indigenous producers of fruits, the government should impose high import duty on these fruits, even if these are not of good quality.
- II. The fruit vendors should stop selling imported fruits so that the demand for indigenous fruits would be increased
- 46. Statement :** Some serious blunders were detected in the accounts section of a factory.
- Courses of action :** I. An efficient team of auditors should be appointed to check the Accounts.
- II. A show cause notice should be issued to all the employees involved in the irregularity.

## SOLUTIONS

- (a) I is a reasonable course of action. Hence follows. Nothing about the market condition is known from the statement. Hence II does not follow.
- (a) I is advisable to be prepared for the storage of the new crop. II is not relevant as the statement says that there will be good crop and does not show any requirement of fertilisers.
- (a) Clearly, proper supervision alone can see the development in practice. So, only course I follows. II will only aggravate the problem.
- (d) I is not a proper way to tackle the problem. Because this action will not help reduce the problem. Hence, I is not advisable. On a similar basis II is also not advisable. None of the two are able to solve the problem.
- (b) I is not advisable because sophisticated weapons must not be provided in lay hands. Further this can lead to villagers turning into dacoits or robbers. II is advisable because this will encourage the villagers.
- (a) I follows because it will lessen the miseries of affected people. II does not follow. What role can the fire brigade play in a problem caused by heavy rain?

7. (d) Neither talks about what should be done. Both only suggest the probable consequences.
8. (b) Only II follows as I doesn't provide solution to the problem. Rather it talks about the contrary and will aggravate the problem further.
9. (a) The first course should be to try their best that transporters don't go on strike. Hence I follows II talks about alternative public transport which is out of context. The statement talks about transport (goods carriers) & not public transport (Bus, auto, ricksha etc.)
10. (d) Money is very important for the execution of any plan. Reduction in other expenditures will definitely help to raise money. Hence I follows. Any programme can not succeed without a good planning. Hence II follows.
11. (d) I is advisable because it will prepare the farmer to face the situation (in a better way) well in advance. II is also advisable because it will be helpful to cope with the problem related to water.
12. (a) Clearly, such projects shall be an asset and a source of income to the country later on. So, course I shall follow.
13. (d) Since severe damage has been caused by cyclone, people in affected villages ought to be shifted to safer places. Also, since relief work entails huge amounts, financial help from Central Government is a must. So, both the courses follow.
14. (a) The effectiveness of such Control Boards is established by the fact that Orissa and A.P. have agreed to it for better control of its multipurpose projects. So, only course I follows.
15. (c) The problem pointed out in the statement is the over crowding of the footpaths, which are meant for the pedestrians. So the problem must be either lessened or completely solved for any of the courses to follow. I follows as this will completely solve the problem. II can also solve the problem as the pedestrians can move easily. Hence either of I or II follows.
16. (d) Clearly, the two diseases mentioned are caused by unhygienic conditions. So, improving the hygienic conditions is a step towards their eradication. Also, constant medication will help timely detection of the disease and hence a proper treatment. So, both I and II follow.
17. (d) I is advisable because partial cut in supply will be useful when water crisis occurs. II is also advisable because minimal use of water by people will help conserve water and ensure smooth supply in future. Both the courses will lead to increase in the water level.
18. (d) I is not advisable because it is explicitly mentioned in the statement that unemployment is the main cause of raise in suicide cases. Love affair lead to suicidal death is out of context. Hence, II is not advisable. III is advisable because it will help minimise the problem. As none of the options shows only III so (d) is correct.
19. (d) The problem is that the railways are dependent on government subsidies as they lack funds/revenues due to lack of concentration on transportation activities. I follows as the committee would be the first step in lessening this problem.
- II follows as this can help the railways in generating more revenues.
- III follows as by living of non-core activities will help the railways in focussing on transportation activities.
20. (b) As mentioned in the statement, 'model M is its first product', so it is necessary to finalise the network of dealers and all matters regarding the sale of the product. Hence I follows. II has no connection with the statement. The statement talks about the launch of the car and not about the maintenance of production schedule. Hence III does not follow.
21. (b) I is a final outcome and not a course of action. II and III are redundant and out of context.
22. (b) According to the statement, the teachers are not familiarised with the need, importance and meaning of population education. Hence II is appropriate.
23. (b) The state government should pay salaries to the employees hence II is logical.
24. (b) The government should ensure regular supply of raw material for food processing industry. Hence II is logical course of action.
25. (a) Since the offer has a hunch, therefore it is logical that he verifies the balance sheet and cash balance. Hence I is appropriate.
26. (b) Logically the voluntary organizations should explore other sources of financial support.
27. (b) Management should involve experienced people for restructuring because their involvement would be beneficial.
28. (b) Display of obscene material should be banned.
29. (c) Train drivers are not supposed to, nor able to stop trains in such situations, hence I is ruled out. Due to collision with running train, chances of bus driver's survival is negligible, hence II is ruled out. III gives a preventive measure for such mishaps.
30. (c) Statement I doesn't suggest a precautionary measure for future; which is there in II and III.
31. (b) Statement III puts all responsibility on fishermen alone. Watching a mishap is no cure for the mishap. Statement I is corrective measure and II is precautionary measure.
32. (d) Eating habit of a society develops through centuries and is impossible to change, hence II can't be implemented. I and III will help address the growth in demand.
33. (c) Faculty members should be persuaded not to go on strike and an action against the members who join the strike should be taken.

34. (a) All the three courses of actions follow in this case. The chemical industries are discharging effluents into the river which may be hazardous hence the chemical factories should be closed down. Now that the water is polluted, it has to be treated chemically before resuming supply, otherwise it may affect those using it. This also gives an example to Pollution Control Board to keep a check to prevent any mishappening at regular intervals.
35. (d) To avoid testing at the primary level admissions the government should take the course of action III .
36. (c) The best option in this case is to divert the load of vehicular traffic through various link roads during peak hours.
37. (b) The officer-in-charge of production should be suspended so as to ensure that this kind of a problem does not happen in future. Also the export order should be sold to the other party.
38. (d) If the entry of outsiders were stopped how would the victims get the help. Hence surely course of action (I) does not follow. Now if the civic administration is making alternate housing arrangements for the victim there is no requirement to shift them and viceversa. Hence II or III follow.
39. (d) After incessant rains there will be many problems regarding shelter, food, and medical facilities of flood effected people.
40. (d) When the disposal cost is already higher then it will effect already by making disposal cost much higher.
41. (b) I is advisable because it will help in formulating plans. II is not a solution of problem.
42. (d) I is advisable because government employment generation scheme will encourage the talented student to opt engineering stream. II is also advisable because without quality education, proliferation of engineering colleges will generate unskilled engineers.
43. (b) I is advisable because thorough investigation would be helpful to bring out all those who are involved in the illegal sale of arms. II has no connection with the statement.
44. (c) Both I and II are not advisable because these are not appropriate approach.
45. (b) I is not fully correlated with statement, so, it is not advisable. II is not practical course of action.
46. (b) I is advisable because it will be helpful to correct the blunders. II is also advisable because it will encourage employees to stop the irregularity.

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# STATEMENT AND CONCLUSIONS

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In this type of questions, a statement is given followed by two conclusions. We have to find out which of these conclusions definitely follows from the given statement.

**What is a 'conclusion'?**

'Conclusion' means a fact that can be truly inferred from the contents of a given sentence.

**DIRECTION (for Examples 1 to 3) :** In each of the following questions, a statement is given followed by two conclusions I and II. Give answer :

- (a) if only conclusion I follows;
- (b) if only conclusion II follows;
- (c) if either I or II follows;
- (d) if neither I nor II follows;

**Example 1 :**

**Statement :** The oceans are a storehouse of practically every mineral including uranium. But like most other minerals, it is found in extremely low concentration – about three gms per 1000 tonnes of water.

**Conclusions :** I. The oceans are a cheap source of uranium.  
II. The oceans harbour radiation hazards.

**Solution :**

- (d) I can not be concluded as most of the minerals are available in similar concentration levels in oceans. II is out of context of the sentence.

**Example 2 :**

**Statement :** Today, out of the world population of several thousand million, the majority of men have to live under government which refuse them personal liberty and the right to dissent.

**Conclusions :** I. People are indifferent to personal liberty and the right to dissent.  
II. People desire personal liberty and the right to dissent.

**Solution :**

- (b) It is mentioned in the statement that most people are forced to live under Governments which refuse them personal liberty and right to dissent. This means that they are not indifferent to these rights but have a desire for them. So, only II follows.

**Example 3 :**

**Statement :** It has been decided by the Government to withdraw 33% of the subsidy on cooking gas from the beginning of next month—A spokesman of the Government.

**Conclusions :** I. People no more desire or need such subsidy from government as they can afford increased price of the cooking gas.  
II. The price of the cooking gas will increase at least by 33% from the next month.

**Solution :**

- (d) I does not follow because a govt's policy is not determined merely by people's needs.  
II does not follow. Let the present price be  $x$   
 $\therefore$  Price if subsidy is removed =  $\frac{x}{0.67} = 1.49x$   
Hence increase in price will be around 49%

**DIRECTION (for Examples 4 to 5) :** In each of the following questions, a statement is given followed by two conclusions I and II. Give answer :

- (a) if only conclusion I follows;
- (b) if only conclusion II follows;
- (c) if either I or II follows;
- (d) if both I and II follow.

**Example 4 :**

**Statement :** Interest rate will be fixed on the basis of our bank's rate prevailing on the date of deposit and refixed every quarter thereafter.

- Conclusions :**
- I. It is left to the depositors to guard their interest.
  - II. The bank's interest rates are subject to change on a day-to-day basis depending on market position.

**Solution :**

- (b) I does not follow because the statement is silent about the depositors. II follows from the phrase "bank's rate prevailing on the date of deposit" which means the rates are subject to day-to-day changes.

**Example 5 :**

**Statement :**

The government of country X has recently announced several concessions and offered attractive package tours for foreign visitors.

- Conclusions :**
- I. Now, more number of foreign tourists will visit the country.

- II. The government of country X seems to be serious in attracting tourists.

**Solution :**

- (d) Clearly, the government has taken the step to attract more tourists. So, both I and II follow.

## EXERCISE

**DIRECTIONS (Qs. 1 - 9) :** In each of the following questions, a statement is given followed by two conclusions I and II. Give answer :

- (a) if only conclusion I follows;  
 (b) if only conclusion II follows;  
 (c) if either I or II follows;  
 (d) if neither I nor II follows;

1. Statement : This book, 'Z' is the only book which focuses its attention on the problem of poverty in India between 1950 and 1980.

- Conclusions :**
- I. There was no question of poverty before 1950.
  - II. No other books deals with poverty in India during 1950 to 1980.

2. Statement : The Electricity Board of state X has given ultimatum to the farmers to either regularise their electric connection by the end of June 2000 or face the legal procedure.

- Conclusions :**
- I. The Electricity Board of state X has failed to provide regular connection to the farmers.
  - II. As the farmers of state X have small farms they don't need electricity for agriculture.

3. Statement : 'We follow some of the best and effective teaching learning practices used by leading institutes all over the world'. —A statement of professor of MN Institute.

- Conclusions :**
- I. The MN Institute is one of the leading institutes of the world.
  - II. Whatever is being followed by world's leading institutes will definitely be good and useful.

4. Statement : In the absence of national health insurance or social security cover, a person with limited resources has to depend on government hospitals, which are crowded, overburdened and understaffed.

- Conclusions :**
- I. National health insurance is meant only for the affluent sections of society.

- II. The government hospitals provide treatment on nominal charges or free.

5. Statement : We do not need today in India extraordinary specialists but those trained ordinary doctors who are dedicated to their profession.

- Conclusions :**
- I. We should promote medical profession with dedicated ordinary doctors rather than promoting high specialised medical education.

- II. Extraordinary specialists are not dedicated to their profession.

6. Statement : "The Government will review the present policy of the diesel price in view of further spurt in the international oil prices" — A spokesman of the Government.

- Conclusions :**
- I. The Government will increase the price of the diesel after the imminent spurt in the international oil prices.

- II. The Government will not increase the price of the diesel even after the imminent spurt in the international oil prices.

7. Statement : Vegetable prices are soaring in the market.

- Conclusions :**
- I. Vegetables are becoming a rare commodity.

- II. People cannot eat vegetables.

8. Statement : Being from a business family, Chandan was apparently convinced by his parents and other family members to join the family trade.

- Conclusions :**
- I. People should take up their family profession so that family prospers.

- II. It is necessary to keep in family members happy by choosing family's business.

9. Statement : Global ecological issues have eclipsed local environmental problems which are being faced by the poor societies.

- Conclusions :**
- I. Poor societies always have to suffer because of their poverty.
  - II. Global ecological issues are not so important. Rich societies can bear with it.

**16. Statement :** A large majority of the work force in India is unorganised. Most of them earn either the minimum or uncertain wages while others are engaged in sundry jobs.

- Conclusions :**
- I. The workers in the organised sector get better facilities and stay longer in their jobs.

- II. Some workers in the unorganised sector of the work force have regular and fixed income.

**17. Statement :** It is almost impossible to survive and prosper in this world without sacrificing ethics and morality.

- Conclusions :**
- I. World appreciates some concepts but may not uphold it.

- II. Concept of ethics and morality are not practicable in life.

**18. Statement :** Research has proved that people eating high fat diets coupled with decreased level of exercises are prone to heart diseases.

- Conclusions :**
- I. People should reduce their high-fat diet as a preventive method.

- II. People must have sufficient level of exercise to reduce their chances of having heart disease.

**19. Statement :** From the next academic year, students will have the option of dropping Mathematics and Science for their school leaving certificate examination.

- Conclusions :**
- I. Students who are weak in Science and Mathematics will be admitted.

- II. Earlier students did not have the choice of continuing their education without taking these subjects.

**DIRECTIONS (Qs. 20 - 24) :** In the question below two statements are given followed by two conclusions I & II. Take the statement to be true and then decide which of the conclusions logically follows. Mark your answer as

- (a) if the conclusion I follows,
- (b) if the conclusion II follows,
- (c) if either conclusion I or II is implicit,
- (d) if neither conclusion I nor II follows.

**20. Statements :** Of the ten fishermen caught in a storm, nine managed to return to the shore.

Praveen has not yet returned after four days.

- Conclusions :**
- I. Praveen got killed in the storm.

- II. Praveen has survived the storm.

**21. Statements :** Now you don't need an import licence to own a VCR.

**DIRECTIONS (Qs. 10 - 19) :** In each of the following questions, a statement is given followed by two conclusions I and II. Give answer :

- (a) if only conclusion I follows;
- (b) if only conclusion II follows;
- (c) if either I or II follows;
- (d) if both I and II follow.

**10. Statement :** Death keeps no calendar.

- Conclusions :**
- I. Man must die one day.

- II. Death can come at any time.

**11. Statement :** Population increase coupled with depleting resources is going to be scenario of many developing countries in days to come.

- Conclusions :**
- I. The population of developing countries will not continue to increase in future.
  - II. It will be very difficult for the governments of developing countries to provide its people decent quality of life.

**12. Statement :** All the organised persons find time for rest. Sunita, inspite of her very busy schedule, finds time for rest.

- Conclusions :**
- I. Sunita is an organised person.
  - II. Sunita is an industrious person.

**13. Statement :** Quality has a price tag. India is allocating lots of funds to education.

- Conclusions :**
- I. Quality of education in India would improve soon.
  - II. Funding alone can enhance quality of education.

**14. Statement :** Yes, I know honesty is the primary concern for discharging the duties of a police officer and my officers are aware of this — Statement of police commissioner of city S.

- Conclusions :**
- I. The statement of police commissioner of city S is absolutely right.
  - II. The statement of police commissioner of city S is not absolutely right.

**15. Statement :** Modern man influences his destiny by the choice he makes unlike in the past.

- Conclusions :**
- I. Earlier there were less options available to man.
  - II. There was no desire in the past to influence the destiny.

- Conclusions :** I. VCRs are now manufactured indigenously.  
II. VCRs are now freely permitted to be imported.
- 22. Statements :** Just about everyone in Germany has been on a diet at one time or the other and millions of them have learned that the weight they lose is all too easily regained.  
Still' despite their frustration, few question the wisdom of dieting.
- Conclusions :** I. Germany should stop dieting.  
II. Germans do not learn from experience.
- 23. Statements :** A study of planning commission reveals boom in revenues. However, this has been of little avail owing to soaring expenditure. In the event, there has been a high dose of deficit financing, leading to marked rise in prices.  
Large financial outlays year after year had little impact on the standard of living.
- Conclusions :** I. A boom in revenues leads to soar in prices.  
II. Large financial outlays should be avoided.
- 24. Statements :** The average number of students per teacher is 50 in the urban area whereas it is 60 in rural areas. The national average is 55.
- Conclusions :** I. The student-teacher ratio in the rural areas is higher than in the urban areas.  
II. More students study with the same teacher in the rural areas as compared to those in the urban areas.
- DIRECTIONS (Qs. 25-29) :** In each of these questions, a statement is given, followed by two Conclusions. Mark your answer as  
(a) if only conclusion I follows;  
(b) if only conclusion II follows;  
(c) if either conclusion I or II follows; and  
(d) if neither conclusion I nor II follows.
- 25. Statement :** Morning walks are good for health.  
**Conclusions :** I. All healthy people go for morning walks.  
II. Evening walks are harmful.
- 26. Statement :** The best way to escape from a problem is to solve it.  
**Conclusions :** I. Your life will be dull if you don't face a problem.  
II. To escape from problems, you should always have some solutions with you.
- 27. Statement :** Vegetable prices are soaring in the market.  
**Conclusions :** I. Vegetables are becoming a rare commodity.  
II. People cannot eat vegetables.
- 28. Statement :** Until our country achieves economic equality, political freedom and democracy would be meaningless.
- Conclusions :** I. Political freedom and democracy go hand in hand.  
II. Economic equality leads to real political freedom and democracy.
- 29. Statement :** Parents are prepared to pay any price for an elite education to their children.
- Conclusions :** I. All parents these days are very well off.  
II. Parents have an obsessive passion for a perfect development of their children through good schooling.
- DIRECTIONS (Qs. 30 - 33) :** Each of these has a statement followed by two conclusions. Mark answer as:  
(a) if only conclusion I follows;  
(b) if only conclusion II follows;  
(c) if either I or II follows;  
(d) if neither I nor II follows.
- 30. Statement :** Good voice is a natural gift but one has to keep practising to improve and excel well in the field of music.
- Conclusions :** I. Natural gifts need nurturing and care.  
II. Even though your voice is not good, one can keep practising.
- 31. Statement :** Domestic demand has been increasing faster than the production of indigenous crude oil.
- Conclusions :** I. Crude oil must be imported.  
II. Domestic demand should be reduced.
- 32. Statement :** Until our country achieves economic equality, political freedom and democracy would be meaningless.
- Conclusions :** I. Political freedom and democracy go hand in hand.  
II. Economic equality leads to real political freedom and democracy.
- 33. Statement :** Parents are prepared to pay any price for an elite education to their children.
- Conclusions :** I. All parents these days are very well off.  
II. Parents have an obsessive passion for a perfect development of their children through good schooling.
- DIRECTIONS (Qs. 34-37) :** In each of these questions, certain statements are given followed by two conclusions numbered I and II. Consider the statement(s) to be true even if they seem to be at variance from commonly known facts. Decide which one of the conclusions logically follows from the statements.
- Mark answer as**
- (a) If only conclusion I follows  
(b) If either conclusion I or II follows  
(c) If only conclusion II follows  
(d) If neither conclusion I nor II follows.

34. Statement : Industrial cities are highly polluted. Pollution means more diseases.  
 Conclusions : I. People who live in industrial cities become immune to diseases.  
 II. People living in cities which are not industrial are healthier than those who live in industrial cities.
35. Statement : My brother sings very well. My sister is a basket-ball player. I am very intelligent.  
 Conclusions : I. We all are very talented.  
 II. We all are sportsmen.
36. Statements : India's economy depends mainly on forests.  
 Conclusions : I. Tree should be preserved to improve Indian Economy.  
 II. India wants only maintenance of forest to improve economic conditions.
37. Statement : The best way to escape from a problem is to solve it.  
 Conclusions : I. Your life will be dull if you don't face problem.  
 II. To escape from problem, you should always have some solutions with you.

**DIRECTIONS (Qs.38 - 40) :** In the questions below, two statements are given followed by two conclusions I and II. You have to consider both the statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the given conclusions is/are definitely drawn from the given statements.  
 Give answer.

1. if only I follows  
 2. if only II follows  
 3. if neither I nor II follows  
 4. if both I and II follows.
38. Statements : When it rains, usually X does not go out. X has gone out.  
 Conclusions : I. It is not raining.  
 II. X has some urgent business to transact.  
 (a) 2 (b) 1  
 (c) 3 (d) 4
39. Statements : In a Golf Club, all the members are not active players of the game but all of them are rich. Mrs. X is a member.  
 Conclusions : I. She is a golfer.  
 II. She is rich.  
 (a) 1 (b) 3  
 (c) 2 (d) 4
40. Statements : All the employees of company A have identity cards. Ram is an employee of company A.  
 Conclusions : I. Ram has an identity card.  
 II. Ram is the General Manager of the Company.  
 (a) 2 (b) 1  
 (c) 4 (d) 3

## SOLUTIONS

1. (d) The statement doesn't mean that there was no poverty before 1950. So I do not follow. Z focusses its attention on the said problem, that doesn't mean that no other book deals with the issue.
2. (d) If I were true, the Board would not warn farmers to regularise their electric connection. Hence I does not follow. Nothing can be concluded about the size of the farms and their need to electricity for agriculture. Hence II does not follow.
3. (d) It may be an assumption which the professor is assuming before passing his statement but it definitely cannot be a conclusion. Hence II does not follow. I may or may not be possible. Hence I does not follow.
4. (b) It is clear that either there is no facility for health insurance available or it is available for only affluent sections. Hence I cannot be definitely concluded. II follows from the given statement, as 'limited resources' of the person suggests that he will go to a hospital which provides treatment on nominal charges or free.
5. (a) Only conclusion I follows. The statement talks about dedicated ordinary doctors but that in no way infers that extra ordinary specialists are not dedicated to their profession. So conclusion II follows. I is true in the context of the scenario prevailing in the country.
6. (c) Either I or II can follow. As the government would be reviewing the diesel prices in light of the spurt in the international oil prices, the govt can either decide to increase or keep the price stagnant (increasing subsidy.)
7. (d) The availability of vegetables is not mentioned in the given statement. So, I does not follow. Also, II is not directly related to the statement and so it also does not follow. Probably the demand is surpassing the supply.
8. (d) I and II are assumptions and not conclusions.
9. (d) The statement does not say why the poor societies suffer. Hence I does not follow. II also does not follow because the statement merely states a fact; it does not look into the merits of the fact.

10. (d) Both I and II directly follow from the statement.
11. (b) With the limited resources and overpopulation it is very hard to provide decent quality of life. Hence II follows.
12. (d) Sunita has a very busy schedule. This means that she is industrious. But still she finds time for rest. This means that she is an organised person. So, both I and II follow.
13. (a) According to the statement, funding is necessary to improve quality and India is allocating funds to education. This means that quality of education will improve in India. So, I follows. But funding alone is sufficient to enhance quality, is not true and doesn't have a mention in the statement. So, II does not follow.
14. (c) Either the commissioner is absolutely right or he is not.
15. (a) Either there were less options available or there was no desire to influence the destiny in the man of the past that's why he couldn't influence his destiny by the choice he made.
16. (b) The workers in the organised sector are not being talked about in the statement. So, I does not follow. It is mentioned that some workers in the unorganised sector are engaged in sundry jobs. This means that they have fixed income. So, II follows.
17. (b) Clearly I is vague and so does not follow. However, II directly follows from the given statement.
18. (d) Both follow because they together take care of the two problems leading to heart diseases.
19. (d) Since the new system gives the students the option of dropping Science and Mathematics, so students weak in these subjects can also be admitted. So, I follows. Also, it is mentioned that the new system will come into effect from the next academic year. This means that it did not exist previously. So, II also follows.
20. (c) As Praveen has not yet returned, he might have got killed or might have survived. Hence (c) is the correct option.
21. (b) Nothing has been said in the statements which imply that VCRs and being now manufactured indigenously. Therefore, I is invalid. Since import licence on VCR's has been withdrawn, they can be now freely imported.
22. (d) Nothing of the sort can be concluded as given in two conclusions on the basis of the statements.
23. (d) Both of the conclusion are invalid.
24. (b) Unless absolute figures are given, no conclusion of the type I can be made. Since average no. of students per teacher (60) in rural areas is higher than the average no. of students per teacher (50) in urban areas, we can conclude that more students study with the same teacher in the rural areas as compared to those in the urban areas.
25. (d) This statement does not mention anything about healthy people. Neither does it mention about evening walks. Hence none of the conclusions follows.
26. (b) The given statement does not tell anything about life. It only tells about problems and the way to escape from them. Hence conclusion II follows.
27. (d) From the fact vegetables prices are rising high, we cannot infer that they are a rare commodity or that the people cannot eat vegetables.
28. (b) The given statement tells about the priority of achieving economic equality. Hence conclusion II follows where it says that the economic equality leads to political freedom and democracy. Conclusion I does not follow because it does not show the comparison among economic equality, political freedom and democracy.
29. (b) The statement tells about the willingness of parents to give the best education to their children. Hence conclusion II follows.
30. (a) Only I concludes. The statement clearly talks about people with good voice and their excelling in music.
31. (c) Statement is followed by either conclusion I or II because these are the only two ways to meet the increasing demand.
32. (b) Clearly statement is followed by conclusion II.
33. (d) Statement is followed neither by conclusion I nor by conclusion II. Statement does not talk about perfect development of their children.
34. (d) Both conclusions I and II does not correlate with statements. So, neither conclusion I nor II follows.
35. (d) I does not follow because it is not given that how is good my sister in basketball. II does not follow because all are not sportsmen.
36. (a) I follows because tree is a part of forest and India's economy depends mainly on forest. II is not correlated with statement. So it does not follow.
37. (d) Both conclusions I and II does not follow because problem solving is the best way not only way.
38. (c) The term 'usually' indicates that some possibility might be possible that X goes out during rain. Nothing has been said about the urgency of the work. Thus neither I nor II follow.
39. (c) All the members of the Golf Club are necessarily rich. Since Mrs. X is a member of the Golf Club, she is rich.
40. (b) Since all employees of the company A have identity cards and Ram is an employee of the company, he must have an identity card.

# 23

CHAPTER

## LOGICAL DEDUCTION

In this section, a passage is given followed by some inferences based on it. We have to examine each inference in the context of given passage and decide its degree of truth or falsity. *Mark answer*

- (a) if the inference is 'definitely true', i.e. it properly follows from the statement of facts given.
- (b) if the inference is 'probably true' though not 'definitely true' in the light of the facts given.
- (c) if the 'data are inadequate', i.e. from the facts given you cannot say whether the inference is likely to be true or false.
- (d) if the inference is 'probably false' though not 'definitely false' in the light of the facts given.
- (e) if the inference is 'definitely false', i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts.

### PASSAGE-1

There has been considerable improvement in the economy for the last ten years. Indian economy has witnessed far-reaching changes, e.g. emergence of India as an IT superpower; there has been wide increase in the global employment for the Indian managers and so have the maximum salaries and so on.

However, there happened great upheaval in corporations, closure of firms and reduction in the size of institutions. There also occurred infiltration of the "Hire & Fire" culture into the corporations. Employment opportunities have also declined.

#### Example 1 :

There are certain positive results of reform in economy but there are also some unfavourable effects.

#### Solution :

- (a) The first para talks of "positive result" and the second of "unfavourable effect".

#### Example 2 :

Before reform in the economy in our country, there was no "Hire and Fire" culture in the world as a whole.

#### Solution :

- (d) It is not cleared that 'Hire and Fire' culture occurred after reform in the economy. Hence, it is probably false.

#### Example 3 :

India can compete with US as it has emerged as an IT superpower.

#### Solution :

- (c) Situation of US economy, especially about IT, is not given.

#### Example 4 :

There are ample employment opportunities for the Indian specialists world over following the closure of some Indian firms.

#### Solution :

- (c) The given fact is neither mentioned in nor can be derived from the contents of the given passage.

#### Example 5 :

The living standard of Indian managers will really improve when they seek jobs in foreign countries.

#### Solution :

- (b) Fetching maximum salary by Indian managers is likely to promote living standards.  
Hence probably true.

### PASSAGE-2

One of the promising features of the current market is that domestic institutions seem to have turned buyers after a very long time. They have been net buyers this month with inflows exceeding by Rs 80 crore till early this month. That's admittedly a small amount, but its significance lies in the fact that domestic institutions have been net sellers every month this financial year except in September when their net purchases amounted to a microscopic Rs. 28 crore. This financial year's net sales by domestic institutions amounted to Rs 2964 crore, which has substantially offset the net inflows of Rs 3187 crore by FIIs. The net purchases by domestic institutions could indicate that money is once again flowing into equity funds, eager not to miss the widely expected rally. Part of this reason could be a shift in investor portfolios, as people lighten up on debt and put that money into equity.

#### Example 6 :

Domestic institutions have been consistently selling only in all the months in this financial year.

#### Solution :

- (c) It is mentioned that domestic institutions have turned buyer after a very long time.

**Example 7 :**

FII's bought more than what was sold by domestic institutions this financial year.

**Solution :**

- (a) It is cleared by the sentence 'This financial' ..... by FII's.

**Example 8 :**

The equity market is expected to experience a subdued activity in near future.

**Solution :**

- (d) Shift in investor portfolios and emerging positive scenario make the inference probably false.

**Example 9 :**

The activities in equity market has direct relationship with the debt market.

**Solution :**

- (b) See the last part of the passage.

**Example 10 :**

It is expected that in the early next financial year the gap between the net sales and net purchases will reduce substantially.

**Solution :**

- (c) No mention about the sales and purchases of next financial year in the passage.

**PASSAGE-3**

In the context of computers, the hardware specialities like the tendency of research connected with human factors, the design of the work stations, key boards, visual display etc. are being concentrated, though the literature connected with interface and software problems has recently been on the increase. There are two reasons for it. The first reason in the light of the increasing power of computers is that the designers have got an opportunity to select and organise that technique which the user follows in communicating the message. The second is that the human

factors research organisations have deviated from physical specialities of self improving work-system and gone to the psychological dimensions of the man-machine interaction.

**Example 11 :**

In the field of computers, a change has taken place in the approach of the human factors research organisations.

**Solution :**

- (a) The given fact directly follows from the last sentence of the passage.

**Example 12 :**

The human factors research organisations do not help in designing the software system. They help only in the evaluation of ultimate production.

**Solution :**

- (b) In the first sentence of the passage, the human factors research organisations has been mentioned a hardware speciality. The given fact seems to be probably true in the light of this truth.

**Example 13 :**

There has been a systematic progress in the basic computer technique.

**Solution :**

- (c) The given fact is neither mentioned in nor can be derived from the contents of the given passage.

**Example 14 :**

The tools and methods of human research organisations have also undergone a change.

**Solution :**

- (a) The given fact directly follows from the last sentence of the passage.

**Example 15 :**

The human research organisations in the field of computers, had been started two decades ago.

**Solution :**

- (c) The given fact is neither mentioned in nor can be derived from the contents of the given passage.

**EXERCISE**

**DIRECTIONS :** Below are given passages followed by several possible inferences which can be drawn from the facts stated in the passage. You have to examine each inference separately in the context of the passage and decide upon its degree of truth or falsity. *Mark answer*

- if the inference is 'definitely true', i.e. it properly follows from the statement of facts given.
- if the inference is 'probably true' though not 'definitely true' in the light of the facts given.
- if the 'data are inadequate', i.e. from the facts given you cannot say whether the inference is likely to be true or false.
- if the inference is 'probably false' though not 'definitely false' in the light of the facts given.
- if the inference is 'definitely false', i.e. it cannot possibly be drawn from the facts given or it contradicts the given facts.

**PASSAGE-1**

Construction industry in India has always enjoyed a special position. We have proved that India is in tune with the times and has not left any stone untouched to compete against the best in international market. Yet, it is the time when other powers are paying attention to developing this sector internationally status. Foundation of an economy lies on its infrastructure. Construction industry has to play a vital role in power, port, road, house construction, railways and industry. Labour-intensive Indian construction industry has to pass through acute changes although it is a bit late. It has to face challenges like advanced designing, odd decision and a growth of demand of work in time, greater mechanisation and intensive construction prevalent in developed countries. The emphasis, is laid on modern techniques adopted in construction and high quality in less time.

1. Indian companies can put their gain to maximum by adopting modern equipment and by reducing the time of project.
2. The policy-makers of India have failed to understand the importance of construction industry.
3. The Indian construction companies have to establish themselves in international market.
4. Construction industry in India has been labour-oriented for years.
5. The construction industry of developed nations of better quality compared to India.
14. The distribution of food-grains to the masses has remained a problem area for India.
15. The policy of India needs to be revamped to reduce the extent of poverty in the country.
16. India always maintains food grain stocks to withstand two consecutive droughts.
17. More than 30 per cent of population in India do not even get two times meals per day.
18. The policy-makers in India are unaware of prevalent hunger.

**PASSAGE-2**

Cotton acreage in India during the current year has fallen by 10% as cotton growers have moved on cultivation of other cash crops. This is the result of the cotton glut in world markets post-September 11 and the consequent slowdown in the world economy. But this scenario brought with it benefits to one segment of the industry—yarn manufacturers—as they get higher prices for their produce. Some yarn manufacturers had stocked up low-priced cotton last year. The combined effect of all this is evident in the rise in net profits and net margins of yarn manufacturers.

6. World economy witnessed an upward trend during pre-September 11 period.
7. The farmers will again grow cotton next year due to increased price of cotton yarn.
8. Land used for growing cotton in India is conducive to grow other cash crops.
9. The yarn manufacturers have marginally suffered during post-September 11 period.
10. There has been a huge drop in the supply of cotton during the current year.
11. There has been shortage of cotton in the world market last year.

**PASSAGE-3**

Procurement of wheat is in full swing in the north-western states of India. By June end, public agencies are likely to end up with food grain stocks of about 40 to 42 million tones, the highest ever witnessed in the history of this country. This stock should be more than sufficient to ensure that country's "food security" is not endangered even if India faces two consecutive droughts. But strangely enough, while the granaries overflow, there is still widespread hunger in the country even without a drought. The estimates of poverty are being debated, but broadly one-third of India seems to remain underfed. And this co-existence of grain surpluses with large-scale hunger should make any serious policy-maker think and examine the existing policy mix with a view to ensure faster economic growth and reduction in poverty.

12. India's foodgrains stock has been satisfactory over the past few years.
13. India, at present, is one of the countries in the world to have sufficient food for its people.

**PASSAGE-4**

India's export of readymade garments increased by almost 11 per cent in value terms during April 2002 at \$ 324 million over the same period last year. As per provisional data compiled by the Apparel Export Promotion Council (AEPC), readymade garment exports were higher by 10.9 per cent in value terms compared to \$ 292.2 million in April 2001. In terms of quantity, exports in April 2002 were 16.8 percent higher at 94 million pieces compared to 80.8 million pieces in the same month a year earlier. Exports in rupee terms increased by over 16 per cent at Rs 1587.3 crore compared to Rs 1368.9 crore a year earlier.

19. Apparel Export Promotion Council (AEPC) releases authentic data, and one can believe it.
20. India's export of readymade garments is increasing every year in both value terms as well as rupee terms.
21. In 2001, there was a recession in garment export.
22. Readymade garments' export is a good option for skilful unemployed persons to deal in.
23. Readymade garments' export in 2001 was more than readymade garments' import in 2001.

**PASSAGE-5**

The World Health Organisation has called for an improved surveillance to combat dengue and says the outbreak can be controlled in two weeks if all necessary steps are taken to stop the mosquitoes from breeding and break the transmission cycle. Dengue is already the most widespread mosquito-borne disease among humans. In the past 15 years, outbreaks in South and South-East Asia have been rapidly rising mostly due to falling environmental and public health standards during urbanisation. WHO reports that severe forms of the disease such as haemorrhagic fever (DHF) and shock syndrome (DSS) are putting more than 2.5 million people at risk worldwide each year. Importantly, 95% of the DHF cases are among children less than 15 years. Therefore, the disease has major impacts on public health and future generations.

24. If rate of urbanisation in South Asia is controlled, outbreaks of all diseases may be reduced.
25. World Health Organisation has not collected data of outbreak of dengue in the past.

26. There was no outbreak of dengue in the European countries in the recent past.
27. Over the last decade South Asian countries have not successfully stepped up mechanism to combat dengue.
28. DSS type dengue seems mostly to be affecting the adults.

## SOLUTIONS

1. (a) From the last sentence it can be inferred.
2. (e) It contradicts the first two sentences of the passage. Hence it is definitely false.
3. (e) The Indian construction companies have already established themselves in international market.
4. (a) The passage talks of "labour-intensive Indian construction industry".
5. (c) It can't be compared from the information given in the passage.
6. (c) According to the passage, world economy witnessed a slowdown during post-September 11 period. But what was the trend of growth of the economy during pre-September 11 period is not known.
7. (d) This will benefit the yarn manufacturers, not the farmers, unless the latter act as the former also.
8. (b) That is why the cotton growers seem to have switched over to other cash crops.
9. (e) Note that yarn manufacturers get benefited in post-September 11 scenario.
10. (b) The passage says nothing about the supply of cotton during the current year. But lack of enthusiasm in cotton growers, fall of cotton acreage and rise in the price of yarn makes the inference probably true.
11. (e) The price of the cotton was very low last year which attracted the yarn manufacturers to store cotton. Therefore, the case of shortage is ruled out.
12. (c) The given paragraph provides no hint about previous foodgrains stocks.
13. (a) From the third sentence, it can be inferred.
14. (a) From the fifth sentence 'one-third of India seems to remain underfed' we can infer so.
15. (a) From the last line it may be inferred.
16. (d) There is no categorical information. But since the stock this year is making news, it is apparently not a usual case.
17. (b) It is not clear from the passage what are the parameters to determine 'underfed' level. But two times meals may be a criterion.
18. (e) It is cleared from the last sentence of passage.
19. (b) Quoting AEPC's provisional data implies that it is likely that the council releases authentic data. Hence, probably true.
20. (c) We have no information about the trend of performance of India's export of readymade garments
21. (c) We have no data of year 2000.
22. (b) The given inference seems to be probably true.
23. (c) We have no data of import. So comparison is not possible.
24. (b) It is mentioned in the passage that 'outbreak in South and South-east Asia have been rapidly rising mostly due to falling environmental and public health standards during urbanisation'. Thus, the fact in the question is quite probable.
25. (e) The passage talks of outbreak of dengue during the past 15 years. This contradicts the fact given in the question.
26. (c) The passage mentions the outbreak of dengue in Asian countries only and not the European countries.
27. (a) It is mentioned in the passage that cases of outbreak of dengue are rapidly rising in South Asian countries since the last 15 years. This means that adequate steps to combat dengue have not been taken.
28. (c) Nothing about the effect of DSS type dengue is mentioned in the passage.

# 24

CHAPTER

# CRITICAL REASONING

Critical Reasoning (CR) is ability to reason clearly to evaluate and judge arguments. You are using this skill a lot during your everyday life while reading newspapers or watching movies. When you think that the movie is pushing the limit of the Reasonable or the news sounds less reasonable than the movie that was pushing the limit, you are using your Critical Reasoning skills to produce these conclusions. The argument you meet can be anything from a classical argument to an advertisement or a dialog. Critical Reasoning questions will ask you to manipulate the argument to weaken/strengthen it, find the conclusion, assumption, explanation, do an inference or supplement a statement, etc. Whatever it is that you have to do, you will need 2 things to succeed: know the basic structure of arguments and clearly understand the argument.

In general, most of them, arguments consist of evidence, usually 2 pieces, a conclusion - the main point of an argument, and an assumption - the bridge between the evidence and conclusion. The majority of the arguments you encounter on the test will be 3 step arguments:

Evidence 1 + Evidence 2 = Conclusion.



**Example 1:** Last week Mike was detained for shoplifting at a groceries store near his house, but he has been a Christian for 10 years, therefore, the police must have been wrong accusing him in stealing.

**Note :** There are two pieces of evidence: 'Mike was accused of stealing' and that 'he is a Christian'. The conclusion is that 'the police are wrong'. Therefore, our huge assumption here is that 'a Christian could not have stolen anything.'

**Example 2:** There are a lot of mosquitoes outside today, please do not turn on the light in the room because a lot of them will fly in.

**Note :** Here the evidences are 'there are a lot of mosquitoes outside today' and 'do not turn on the light'. The conclusion is that 'Many will fly in' and the assumption is 'mosquitoes will approach the light.'

There is no set scheme for structure in CR, but since the majority of the arguments are only a few sentences long, the conclusion usually comes in the first or the last sentence. However, some of the arguments encountered will not have a conclusion at all or will have just an implied one.

## Strategy to Crack Critical Reasoning Questions

*This strategy is not the easiest way to do CR (the easiest would be read-and-answer), but it lets you get the most questions right spending less time per correct answer.*

1. Read the questions first; this is needed so that you would know what to look for and what to do: find an assumption, strengthen/weaken, infer something or else; do not worry about the details in the question, read for keywords, such as strengthen, deny, or explain. [Use symbols for convenience, e.g. + for strengthen or – for weaken].
2. Read the passage very attentively because in contrast to Reading Comprehension, there is very little text here and mostly everything is important; try to read only once. Reread if required.  
As you read, look for the problem in the passage (evaluate how convincing it is)
3. Paraphrase (reword) the passage. It is a very important step because when you do a paraphrase, you check whether you understood the passage and at the same time you extract the skeleton of the argument, making it easier to identify the conclusion and the assumption. Very often, the paraphrase of the passage will be pretty close to the conclusion. It is not surprising, since the conclusion is the main point and evidence just supports it.) Your paraphrase should be as close to the text and as simple as possible so that you would understand it easily and at the same time could fully trust it. Do not make it too general nor too detail oriented. When you do a paraphrase, do it in three steps: Evidence1, Evidence2, and Conclusion; put "therefore" word before you start your conclusion, this will help you to set it off.  
Read the question again (now with more understanding of what is being asked; reading the question 2 times, it will also help you to make sure your answer exactly what is stated and that you understand the question.)

5. Answer before reading the answer choices. There are two reasons for this :
  - (i) if you can think of the correct answer or at least the general direction that the answer choice needs to be, you will identify it among the wrong choices much faster, thus spend less time reading the answers, which usually take 30 seconds to cover.
  - (ii) Often students are seduced by the author's wording. One reads a few words that were used in the passage and the brain identifies this choice with the passage, thus making it seem more right than it needs to be. The more problems you practice with, the more chance is you will guess the right answer even before reading it.
6. Go through the answers, first time scan them for YOUR answer choice (usually you will guess correctly in 60-70% of cases), if you did not find it, reread them more attentively.
7. Draw a grid to eliminate the wrong answers easier. Use “✓” for a sure answer, “✗” for a definitely wrong answer choice, and “?” for an answer that may be right or questionable. This will help to concentrate only on a few answer choices and will prevent you from reading same answers several times if you get confused or keep having troubles locating the right answer.

#### Types of Critical Reasoning Questions

Critical reasoning questions will ask you to:

1. Identify the inference / Must be true question
2. Identify the assumption.
3. Strengthen an argument.
4. Weaken an argument.
5. Select the best conclusion / Main Point
6. Identify the paradox
7. Evaluation/ Reasoning
8. Identify a parallel argument/Structure.

#### 1. IDENTIFY THE INFERENCE / MUST BE TRUE QUESTION

These type of questions are extremely common. An Inference means the same thing as “must be true”. Conclusions differ from inferences in that conclusions are the result of premises and inferences are something that must be true. The following are the typical Inference (Must be true) based Questions:

- If the statements above are true, which of the following must also be true?
- Which of the following is [implied, must be true, implicit, most reasonably drawn] in the passage above?
- Which of the following inferences is best supported by the statement made above?

**How to tackle “Identify the inference / Must be true questions”:**

- Read the stimulus and look for the argument.
- Note that Must Be True questions may not contain an argument. They may just be a series of facts. Nevertheless, try to find the argument.
- Avoid choices which contain absolute statements -

never, always, none, only etc. Although these words might appear in some correct choice, you should be very sure about them.

Some of the options can be eliminated as they go beyond the scope of the passage. Note that an inference can be based on only some of the information provided and not the complete passage.

#### Example 1 : Stimulus Argument

Increases in funding for police patrols often lower the rate of crimes of opportunity such as petty theft and vandalism by providing visual deterrence in high-crime neighborhoods. Levels of funding for police patrols in some communities are increased when federal matching grants are made available.

#### Question :

Which of the following can be correctly inferred from the statements above?

#### Options :

- (a) Areas with little vandalism can never benefit from visual deterrence.
- (b) Communities that do not increase their police patrols are at higher risk for crimes of opportunity late at night.
- (c) Federal matching grants for police patrols lower the rate of crimes of opportunity in some communities.
- (d) Only federal matching grants are necessary to reduce crime in most neighborhoods.

**Sol. :** (c) (c) is a summary of the information provided; it is the logical end of a chain of reasoning started in the stimulus argument. The sequence of events goes like this :

Increased funding → Increased visual deterrence  
→ Lower crime

The last statement could be mapped as follows:

Federal grants → Increased patrol funds

(c) makes the chain complete by correctly stating that federal grants can lead to lower crime in some communities. Now the logical chain becomes:

Federal grants → Increased funding → Increased visual deterrence → Lower crime

The other answer choices may not be correctly inferred because they go beyond the scope of the argument. They may be objectively, factually correct, or they may be statements that you would tend to agree with. However, you are limited to the argument presented when choosing a correct answer.

#### 2. IDENTIFY THE ASSUMPTION.

An assumption is an unstated premise that supports the author's conclusion. It's the connection between the stated premises and the conclusion. An assumption is something that the author's conclusion depends upon. Assumption questions are extremely common and have types that look like this:

- Which of the following most accurately states a hidden assumption that the author must make in order to advance the argument above?
- Which of the following is an assumption that, if true, would support the conclusion in the passage above?

**How to approach "Identify the assumption Questions"**

- Look for gaps between the premises and the conclusion. Ask yourself why the conclusion is true. Before you progress to the answer choices, try to get feel of what assumption is necessary to fill that gap between the premises.
- Beware of extreme language in the answer choices of assumption questions. Assumptions usually are not extreme. "Extreme" answer choices usually contain phrases such as always, never, or totally.

**Example 2 : Stimulus Argument**

Traditionally, decision making by doctors that is carefully, deductively reasoned has been considered preferable to intuitive decision making. However, a recent study found that senior surgeons used intuition significantly more than did most residents or mid-level doctors. This confirms the alternative view that intuition is actually more effective than careful, methodical reasoning.

**Question :**

The conclusion above is based on which of the following assumptions?

**Options :**

- Senior surgeons are more effective at decision making than are mid-level doctors.
- Senior surgeons have the ability to use either intuitive reasoning or deductive, methodical reasoning in making decisions.
- The decisions that are made by mid-level and entry-level doctors can be made as easily by using methodical reasoning as by using intuitive reasoning.
- Senior surgeons use intuitive reasoning in making the majority of their decisions.

**Sol. :** (a) The correct answer is (a), which provides a missing link in the author's reasoning by making a connection from the evidence: that intuition is used more by senior surgeons than other, less-experienced doctors, and the conclusion: that, therefore, intuition is more effective. None of the other choices helps bridge this gap in the chain of reasoning. Although some of the other statements may be true, they are not responsive to the question. In fact, they mostly focus on irrelevant factors such as appropriateness, ease of application, ability, etc.

**3. STRENGTHEN AN ARGUMENT.**

Assumptions connect premises to conclusions. An argument is strengthened by strengthening the assumptions. Here are some examples of Strengthen question types :

- The conclusion would be more properly drawn if it were made clear that...
- Which of the following, if true, would most strengthen the conclusion drawn in the passage above?

**How to approach "Strengthen an argument"**

- Once you have identified the argument of the passage, i.e. the evidence(s) + conclusion, try putting in each option with the argument. Check if the assumption(s) you have drawn is (are) strengthened if you accept the content of the option as true.

**Example 3 : Stimulus Argument**

Three years after the Bhakra Nangal Dam was built, none of the six fish species native to the area was still reproducing adequately in the river below the dam. Because the dam reduced the average temperature range of the water from approximately 40° to approximately 10°, biologists have hypothesized that sharp increases in water temperature must be involved in signaling the affected species to begin their reproduction activities.

**Question :**

Which of the following statements, if true, would most strengthen the scientists' hypothesis?

**Options :**

- The native fish species were still able to reproduce in nearby streams where the annual temperature range remains approximately 40°.
- Before the dam was built, the river annually overflowed its banks, creating temporary backwaters that were used as breeding areas for the local fish population.
- The lowest temperature ever recorded in the river prior to dam construction was 30°; whereas the lowest recorded river temperature after construction was completed has been 40°.
- Non-native fish species, introduced after the dam was completed, have begun competing with the native species for food.

**Sol. :** (a) (a) most strengthens the conclusion that the scientists reached. It does so by showing that there is a control group. In other words, a similar population, not subjected to the same change as the population near the dam, did not experience the same type of result. Here the basic assumption about the conclusion that scientists reached is that 'because of the reduction of average temperature range of the water, the reproduction of the native fish species has reduced drastically'. Option (a) clearly strengthens the assumption.

**4. WEAKEN AN ARGUMENT.**

Assumptions connect premises to conclusions. An argument is weakened by weakening the assumptions. Here are some examples of Weaken question types :

- Which of the following, if true, would weaken the conclusion drawn in the passage above?

- The argument as it is presented in the passage above would be most strengthened if which of the following were true?

**How to approach "Weaken an argument"**

- Once you have identified the argument of the passage, i.e. the evidence(s) + conclusion, try putting in each option with the argument. Check if the assumption(s) you have drawn is (are) weakened if you accept the content of the option as true.

**Example 4 : Stimulus Argument**

A drug that is very effective in treating some forms of cancer can, at present, be obtained only from the bark of the Raynu, a tree that is quite rare in the wild. It takes the bark of approximately 5,000 trees to make one pound of the drug. It follows, then, that continued production of the drug must inevitably lead to the raynu's extinction.

**Question :**

Which of the following, if true, most seriously weakens the above conclusion?

**Options :**

- The drug made from Raynu bark is dispensed to doctors from a central authority.
- The drug made from the Raynu bark is expensive to produce.
- The Raynu generally grows in largely inaccessible places.
- The Raynu can be propagated from cuttings and cultivated by farmers.

**Sol. :** (d) (d) provides an alternate source of the Raynu bark. Even though the tree is rare in the wild, the argument is silent on the availability of cultivated trees. The author of the argument must be assuming that there are no Raynu trees other than those in the wild, in order to make the leap from the stated evidence to the conclusion that the Raynu is headed for extinction. The option (d) weakens the assumption - 'there are limited raynu trees' - by saying that there are other ways as well for the propagation of Raynu. The other answer choices all contain information that is irrelevant. Note that the correct choice does not make the conclusion of the argument impossible. In fact, it is possible that there may be domesticated Raynu trees and the species could still become extinct. Answer choice (d) is correct because it makes the conclusion about extinction less likely to be true.

**5. CONCLUSION / MAIN POINT QUESTION**

In Main Point / Conclusion questions, you have to identify the conclusion of an argument. You are trying to find the author's point and should approach this question in a similar way to the reading comprehension main point questions. They come in several different formats:

- The main point of the passage is that...
- Which of the following statements about... is best supported by the statements above?
- Which of the following best states the author's conclusion in the passage above?
- Which of the following conclusions can be most properly drawn from the data above?

The conclusion of arguments in Main Point questions is usually not directly stated. To find the conclusion, identify the premises and then identify the conclusion drawn from the premises. Main Point questions differ from the other Critical Reasoning questions in that the argument in the stimulus is usually valid. (In most other Critical Reasoning questions the reasoning is flawed.) Conclusion questions require you to choose the answer that is a summary of the argument.

**How to approach "Main Point Questions":**

- Main Point answers must be within the scope of the passage.
- Your opinions or information outside of the passage are always outside of the scope.
- Some of the options given can be out of the scope of the passage.
- Knock out answers with extreme wording. Main Point answers typically do not use *only*, *always*, *never*, *best* or any strong words that leave little room.

**Example 5 : Stimulus Argument**

People should be held accountable for their own behaviour, and if holding people accountable for their own behaviour entails capital punishment, then so be it. However, no person should be held accountable for behaviour over which he or she had no control.

**Question :**

Which of the following is the most logical conclusion of the argument above?

**Options :**

- People should not be held accountable for the behaviour of other people.
- People have control over their own behaviour.
- People cannot control the behaviour of other people.
- People have control over behaviour that is subject to capital punishment.

**Sol. :** (b) The correct response is (b). The argument includes the following two premises:

*Premise 1:* People are accountable for their own behaviour.

*Premise 2:* People are not accountable for behaviour they cannot control.

Here's the logical conclusion based on these two premises:

*Conclusion:* People can control their own behaviour.

- (a) would require that people never have control over the behaviour of other people. Yet the argument does not provide this premise.
- (b) would require that people should not be held accountable for the behaviour of other people. Yet the argument does not provide this premise.
- (d) is not inferable. The argument allows for the possibility that a person might not have control over another person's behaviour which is subject to capital punishment.

## 6. IDENTIFY THE PARADOX

These questions present you with a paradox, a seeming contradiction or discrepancy in the argument, and ask you to resolve it or explain how that contradiction could exist. In other words, there are two facts that are both true, and yet they appear to be in direct conflict with one another. Here are some examples of the ways in which these questions are worded:

- Which of the following, if true, would help to resolve the apparent paradox presented above?
- Which of the following, if true, contributes most to an explanation of the apparent discrepancy described above?

### How to approach "Identify the paradox questions"

- Read the argument and find the apparent paradox, discrepancy, or contradiction.
- State the apparent paradox, discrepancy, or contradiction in your own words.
- Use process of elimination. The best answer will explain how both sides of the paradox, discrepancy, or contradiction can be true. Eliminate answers that are out of scope.

## Example 6 : Stimulus Argument

Town Y is populated almost exclusively by retired people and has almost no families with small children. Yet Town Y is home to a thriving business specializing in the rental of furniture for infants and small children.

### Question :

Which of the following, if true, best reconciles the seeming discrepancy described above?

### Options :

- (a) The business specializing in the rental of children's furniture buys its furniture from distributors outside of Town Y.
- (b) The few children who do reside in Town Y all know each other and often stay over night at each other's houses.
- (c) Many residents of Town Y who move frequently prefer to rent their furniture rather than buy it outright.
- (d) Many residents of Town Y must provide for the needs of visiting grandchildren several weeks a year.

**Sol. :** (d) The correct answer (d), explains why a town of mostly retired residents might need to rent children's furniture. The other answer choices all contain irrelevant information. This further illustrates the fact that, on all question types, if you eliminate the irrelevant choices, the remaining choice will most likely be correct.

## 7. EVALUATION/REASONING BASED QUESTIONS

Reasoning questions ask you to describe how the argument was made, not necessarily what it says. These questions are closely related to assumption, weakening, and strengthening questions. The correct answer identifies a question that must be answered or information that must be gathered to determine how strong the stimulus argument is. The information will be related to an assumption that the author is making. Another type of question that you will encounter asks you to *identify a flaw* in the stimulus argument. The question tells you that there is a problem with the logic of the argument. You just have to choose the answer that describes the flaw. Here are some examples of the ways in which these questions are worded:

- How does the author make his point?
- A major flaw in the argument above is that it...
- A's response has which of the following relationships to B's argument?

### How to approach Reasoning Questions

- Read the argument and find the conclusion..
- State the reasoning in your own words.
- Check whether the reasoning given in the various options fall in line with the reasoning described above.

## Example 7 : Stimulus Argument

Some observers have taken the position that the recently elected judge is biased against men in divorce cases that involve child custody. But the statistics reveal that in 40% of such cases, the recently elected judge awards custody to the fathers. Most other judges award custody to fathers in only 20%-30% of their cases. This record demonstrates that the recently elected judge has not discriminated against men in cases of child custody.

### Question :

The argument above is flawed in that it ignores the possibility that

### Options :

- (a) A large number of the recently elected judge's cases involve child custody disputes.
- (b) The recently elected judge is prejudiced against men in divorce cases that do not involve child custody issues.
- (c) The majority of the child custody cases that have reached the recently elected judge's court have been appealed from a lower court.
- (d) The evidence shows that men should have won custody in more than 40% of the recently elected judge's cases involving divorcing fathers.

**Sol :** (d) The correct answer (d), points out a flaw in the argument. Specifically, it points out that the author of the argument was comparing the recently elected judge to other judges, not to the evidence presented in the recently elected judge's cases. In other words, the author of the argument made an unwarranted assumption that the recently elected judge did not rule against many men in custody battles where the evidence clearly favored the men. As with strengthening and weakening questions, the correct answer in flaw questions often involves unwarranted assumptions.

#### Example 8 : Stimulus Argument

Although dentures produced through a new computer-aided design process will cost more than twice as much as ordinary dentures, they should still be cost effective. Not only will fitting time and X-ray expense be reduced, but the new dentures should fit better, diminishing the need for frequent refitting visits to the dentist's office.

#### Question :

Which of the following must be studied in order to evaluate the argument presented above?

#### Options :

- (a) The amount of time a patient spends in the fitting process versus the amount of money spent on X-rays
- (b) The amount by which the cost of producing dentures has declined with the introduction of the new technique for producing them
- (c) The degree to which the use of the new dentures is likely to reduce the need for refitting visits when compared to the use of ordinary dentures
- (d) The amount by which the new dentures will drop in cost as the production procedures become standardized and applicable on a larger scale

**Sol :** (c) The correct answer (c), highlights an assumption in the stimulus argument. It shows that the author must be assuming that the reduction in refitting with the new dentures compared to ordinary dentures is significant in order to conclude that that difference will help offset an initial outlay that is twice as much. In other words, if you answer the question posed by answer choice (c) with "not much," the argument is weakened. If you answer it with "a tremendous amount," the argument is strengthened. The other answer choices are all irrelevant because no matter what the answers are, there is no impact on the relationship between the evidence presented in the stimulus argument and its conclusion.

#### 8. IDENTIFY A PARALLEL ARGUMENT/STRUCTURE

The last type of Critical Reasoning question is the *parallel structure* question. In this type of question, you must choose the answer that has the same structure as the stimulus argument. In other words, you have to find the argument that is analogous to the given argument in that it includes the same relationship between the evidence presented and the conclusion. Here are some examples of the ways in which these questions are worded:

- Which of the following is most like the argument above in its logical structure?
- Which of the following is a parallel argument to the above given argument?

#### Example 9 : Stimulus Argument

It is true that it is against international law to provide aid to certain countries that are building nuclear programs. But, if Russian companies do not provide aid, companies in other countries will.

#### Question :

Which of the following is most like the argument above in its logical structure?

#### Options :

- (a) It is true that it is against United States policy to negotiate with kidnappers. But if the United States wants to prevent loss of life, it must negotiate in some cases.
- (b) It is true that it is illegal to sell diamonds that originate in certain countries. But there is a long tradition in Russia of stockpiling diamonds.
- (c) It is true that it is illegal for an attorney to participate in a transaction in which there is an apparent conflict of interest. But, if the facts are examined carefully, it will clearly be seen that there is no actual conflict of interest in the defendant's case.
- (d) It is true that it is against the law to steal cars. But someone else certainly would have stolen that car if the defendant had not done so first.

**Sol :** (d) The correct answer (d), has the same structure as the stimulus argument. If you just replace "aid to developing nuclear powers" with "car theft," and "Russian companies" with the "defendant," it is essentially the same argument. Sometimes the parallel structure is easier to see if you use symbols to represent the terms of the argument: It is true that X is illegal. But, if Y doesn't do it, others will. Granted, the stimulus argument is in the future tense and the credited answer is in the past tense. However, it certainly is *most* like the stimulus.

## MISCELLANEOUS EXAMPLES

1. Stock analyst: "We believe Company A's stock will appreciate at 35% a year for the next 5 to 7 years. Company A just became the leader in its industry and we expect its sales to grow at 8% a year."

Commentator: "But how can the stock's price be expected to grow more quickly than the company's underlying sales?"

**Which of the following facts would best support the stock analyst?**

- (a) The company's expenses will be declining over the next 5 to 10 years.
- (b) The company just won a patent on a new product.
- (c) Company A's stock is currently overvalued by a significant amount.
- (d) The 5 to 7 year time frame is too long for anyone to accurately forecast.

**Sol. :** (a) Answer choices (c) and (d) weaken the analyst's argument. Choice (b) is not conclusive because it indicates the patent is on a new product and we do not know if the patent is for a product consumers will demand. Answer choice A is the best one available. If the revenues increase and the expenses decrease, then the company can significantly increase its profits and be more likely to enjoy a high stock price appreciation rate.

2. Acme brand aspirin claims to be the best headache relief available on the market today. To prove this claim, Acme called 10 people and asked them their thoughts on headache relief products. All 10 of them stated that they unequivocally use Acme brand aspirin on a regular basis and that they believe it to be the best headache relief available on the market today.

**Which of the following would most weaken this argument?**

- (a) Acme brand aspirin is highly addictive.
- (b) The 10 people called were married to the company's top 10 executives, and they were coached on what to say.
- (c) Most people choose to suffer silently through their headaches and take no medicines whatsoever.
- (d) This survey was conducted by an independent company.

**Sol. :** (b) Answer choice (d) actually strengthens the argument — which is the opposite of what the question asks you to do. Answer choice (c) is completely irrelevant to the argument. Acme could still be the best product, even if most people don't intend to use it. Answer choice (a) certainly does not bode well for the quality of Acme's aspirin, but it is nonetheless possible that competing brands are even more addictive. Answer choice (b) is correct. It weakens the passage's argument by undercutting its implied assumption that a sample of 10 people must give accurate results.

**Note:** It is a favorite MBA Entrance Test question tactic to test for your understanding of basic statistics. You should understand how statistics can be manipulated, particularly with small and nonrandom samples, as was done here with a small and biased sample of aspirin-takers.

3. My neighbor's dogs bark and howl every time their owner lets them outside. My CPA told me that dogs tend to bark and howl when they see birds resting in the top branches of their favorite trees. I personally believe they bark and howl because they enjoy disrupting my meditations.

**Which of the following can be inferred from the preceding passage?**

- (a) The dogs must be abused by their owners.
- (b) The dogs' owners do not care how they are viewed by their neighbors.
- (c) There are many pedestrians who walk by this neighbor's house, and the dogs are starving for attention.
- (d) The dogs will bark and howl at 3 a.m. if they are outside at that time.

**Sol. :** (d) Answer choice (d) can be easily, directly, and correctly inferred from the statement that the dogs bark and howl every time their owner lets them outside. The rest of this passage is "decoy" material, as discussed in the preparation techniques and tips webpage.

4. In the sport of maxiball, in which the objective is to score more goals than the opposing team, each team member faces off against one member of the other team. The coach for the Panthers predicts victory over the Cougars in an upcoming match between these two maxiball teams. The chief reason for the coach's prediction is that the Cougars' best defensive player will not be defending against Fonsica, who is the Panthers' highest scoring player.

**Which of the following, if true, would cast most doubt on the accuracy of the prediction made by the Panthers' coach above?**

- (a) The Panthers have defeated fewer opponents than the Cougars this year.
- (b) The Cougars' highest scoring player will not be defending against Fonsica.
- (c) The Panthers' best defensive player will not be defending against the Cougars' highest scoring player.
- (d) Fonsica is not the Panthers' best defensive player.

**Sol. :** (c) If (c) is true, then the Cougars are likely to score more goals than if (c) is not true. The more goals the Cougars score the less likely the coach's prediction will come true.

(a) tends to weaken the argument. However, we are not informed whether the Panthers and Cougars have

played the same teams or the same number of teams this year. Without this additional information, the effect of (a) on the coach's argument is dubious. Moreover, (A) does not address the coach's *chief reason* for his prediction.

(b) fails to provide sufficient information to assess its effect on the coach's argument. We must also be informed how Fonsica's effectiveness as a defender. [If Fonsica is the Panthers' best defender, than (b) would weaken the argument. On the other hand, if he is not the Panthers' best defender, then (b) would strengthen the argument.]

(d) fails to provide sufficient information to assess its effect on the coach's argument. (d) would weaken the argument if Fonsica will be defending against the Cougars' highest scoring player. However, we are not informed whether this is the case.

5. In 1998 more citizens from the country of Monrovia migrated from Monrovia to neighboring Abstania than during any prior year. In 1998 the number of reported violent crimes in Abstania increased dramatically over 1997. The unavoidable conclusion is that Monrovians who migrated from Monrovia to Abstania were responsible for this increase.

**Which of the following statements, if true, would most seriously weaken the claim that Monrovians were responsible for the increase in violent crime in Abstania during 1998?**

- (a) During 1998 more violent crimes were reported in Abstania than in Monrovia.
- (b) In 1998 no Monrovians migrated from either Monrovia or Abstania to any country other than Monrovia or Abstania.
- (c) In 1998 the number of unreported violent crimes in Abstania increased as well.
- (d) In 1998 fewer Monrovians migrated from Monrovia to Abstania than from Abstania to Monrovia.

**Sol. :** (d) The argument relies on the unstated assumption that Abstania's Monrovian population either remained stable or increased during 1998. However, (d) provides that this population actually declined in 1998, despite the influx of Monrovians. Given that the number of Monrovians residing in Abstania decreased while the crime rate increased, (d) reduces the likelihood that it was Monrovians who were responsible for the increase in violent crime in 1998.

(a) provides no information useful in evaluating the argument. Whether (a) strengthens the argument depends on addition considerations as well, such as: the total population of Monrovia compared to Abstania; whether the Monrovian population increased or decreased in each country during the year; and whether the crime rate in Monrovia increased or decreased during 1998.

(b) actually *strengthens* the argument. By providing evidence that number of Monrovians residing in

Abstania increased in 1998, (b) makes it more likely that Monrovians were responsible for the increase in violent crime that year.

(c) actually *strengthens* the argument, by affirming the essential premise that the number of violent crimes in Monrovia increased dramatically during 1998.

6. Beautiful beaches attract people, no doubt about it. Just look at this city's beautiful beaches, which are among the most overcrowded beaches in the state.

**Which of the following exhibits a pattern of reasoning most similar to the one exhibited in the argument above?**

- (a) Moose and bear usually appear at the same drinking hole at the same time of day. Therefore, moose and bear must grow thirsty at about the same time.
- (b) Children who are scolded severely tend to misbehave more often than other children. Hence if a child is not scolded severely that child is less likely to misbehave.
- (c) This computer program helps increase the work efficiency of its users. As a result, these users have more free time for other activities.
- (d) During warm weather my dog suffers from fleas more so than during cooler weather. Therefore, fleas must thrive in a warm environment.

**Sol. :** (d) The original argument bases a conclusion that one phenomenon causes another on an observed correlation between the two phenomena. The argument boils down to the following:

*Premise:* X (beautiful beach) is correlated with Y (crowd of people).

*Conclusion:* X (beautiful beach) causes Y (crowd of people).

Answer choice (d) demonstrates the same pattern of reasoning:

*Premise:* X (warm weather) is correlated with Y (fleas).

*Conclusion:* X (warm weather) causes Y (fleas).

(a) demonstrates a different pattern of reasoning than the original argument:

*Premise:* X (moose at the drinking hole) is correlated with Y (bears at the drinking hole).

*Conclusion:* X (moose) and Y (bear) are both caused by Z (thirst).

(b) demonstrates a different pattern of reasoning than the original argument:

*Premise:* X (scolding children) is correlated with Y (misbehavior among children).

*Assumption:* Either X causes Y, or Y causes X.

*Conclusion:* Not X (no scolding) will be correlated with not Y (no misbehavior).

(c) demonstrates a different pattern of reasoning than the original argument:

*Premise:* X (computer program) causes Y (efficiency).

*Assumption:* Y (efficiency) causes Z (free time).

*Conclusion:* X (computer program) causes Z (free time).

**EXERCISE**

1. The purpose of the proposed law requiring a doctor's prescription for obtaining hypodermic needles is to lower the incidence of drug-related deaths, both accidental and intentional, involving hypodermic needles. But even knitting needles can be lethal if they fall into the wrong hands; yet everyone would agree that imposing legal restrictions on obtaining knitting needles would be preposterous. Hence the proposed law involving hypodermic makes no sense and should not be enacted.  
**Which of the following, if true, would provide most support for the argument above?**
  - (a) Knitting needles have been known to cause injury and death.
  - (b) The benefits of hypodermic needles outweigh those of knitting needles.
  - (c) The proposed law would not deter the sort of activity known to result in drug-related deaths.
  - (d) Knitting needles are not readily available to anybody who wants to obtain them.
2. During the past week, 120 PureTech Corporation employees have reported symptoms of a strain of food poisoning known as disporella, but only eight of these employees have tested positive for the strain. A PureTech spokesperson claims that the apparent outbreak of disporella can be attributed to contaminated food served two weeks ago at the company's annual employee picnic.  
**Which of the following, if true, would most support the claim made by the PureTech spokesperson above?**
  - (a) Disporella symptoms generally last only a few days.
  - (b) PureTech's cafeteria facilities provide lunch to PureTech employees during every workday.
  - (c) People with disporella do not generally test positive for disporella until at least one week after disporella symptoms begin to occur.
  - (d) People with disporella often do not exhibit disporella symptoms until more than a week after contracting disporella.
3. Wendy, a student, is an avid backgammon player. All students play either chess or checkers, but some checkers players do not play chess because they do not understand chess strategy. Backgammon players never play checkers, because they do not find checkers challenging. Therefore, Wendy must understand chess strategy.  
**Which of the following must be true for the conclusion drawn above to be logically correct?**
  - (a) All chess players understand chess strategy.
  - (b) Backgammon is more challenging than checkers.
  - (c) Chess is more challenging than backgammon.
  - (d) All students who find backgammon challenging play checkers.
4. As any economist knows, healthy people pose less of an economic burden to society than unhealthy people. Not surprisingly, then, every dollar our state government spends on prenatal care for undocumented immigrants will save taxpayers of this state three dollars.

**Which of the following, if true, would best explain why the statistics cited above are not surprising?**

- (a) The state's taxpayers pay for prenatal care of all immigrants.
  - (b) Pregnant women who do not receive prenatal care are more likely to experience health problems than other pregnant women.
  - (c) State benefits for prenatal care serve to promote undocumented immigration.
  - (d) Babies whose mothers did not receive prenatal care are just as healthy as other babies.
5. Our school district should not spend its money on the new Verbal Advantage reading program. After all, our students get all the reading practice they need by studying history and science.  
**The argument above depends on which of the following assumptions?**
    - (a) The Verbal Advantage program would not help the students learn history and science.
    - (b) Other reading programs are just as effective but less expensive than the Verbal Advantage program.
    - (c) The Verbal Advantage program involves only reading practice.
    - (d) Teaching students history and science is more important than teaching them reading skills.
  6. Newspaper publishers earn their profits primarily from advertising revenue, and potential advertisers are more likely to advertise in newspapers with a wide circulation—a large number of subscribers and other readers—than with other newspapers. But the circulation of the newspaper that is currently the most profitable one in this city has steadily declined during the last two years, while the circulation of one of its competitors has steadily increased.  
**Any of the following, if true, would help explain the apparent discrepancy between the two statements above EXCEPT:**
    - (a) Advertisers generally switch from the most widely circulated newspaper to another one only when the other one becomes the most widely circulated newspaper instead.
    - (b) Advertising rates charged by the most profitable newspaper in the city are significantly higher than those charged by its competitors.
    - (c) The most profitable newspaper in the city receives revenue from its subscribers as well from advertisers.
    - (d) The number of newspapers competing viably with the most profitable newspaper in the city has increased during the last two years.
  7. Most citizens are very conscientious about observing a law when they can see the reason behind it. For instance, there has been very little need to actively enforce the recently-implemented law that increased the penalty for motorists caught leaving a gas station without paying for gas they had pumped into their vehicles. This is because citizens are very conscientious of the high cost of gasoline and they know that stealing gas will only further increase the price of gasoline for everyone.

**Which of the following statements would the author of this passage be most likely to believe?**

- (a) The increased penalty alone is a significant motivation for most citizens to obey the law.
  - (a) There are still too many inconsiderate citizens in the local community.
  - (c) High gasoline prices can be brought down if everyone does his or her part and pays for the gasoline they use at the pumps.
  - (d) Society should make an effort to teach citizens the reasons for its laws.
8. Efficiency is all right in its place, in the shop, the factory, the store. The trouble with efficiency is that it wants to rule our play as well as our work; it won't be content to reign in the shop, it follows us home.

**It can be inferred from the above passage that**

- (a) Efficiency can become all-pervading
  - (b) Efficiency does not always pay
  - (c) Efficiency can be more of a torture than a blessing
  - (d) None of these
9. The company encourages its managers to interact regularly, without a pre-set agenda, to discuss issues concerning the company and society. This idea has been borrowed from the ancient Indian concept of religious congregation, called *satsang*. Designations are forgotten during these meetings; hence, it is not uncommon in these meetings to find a sales engineer questioning the CEO on some corporate policy or on his knowledge of customers

**Based on the information provided in the above passage, it can be inferred that**

- (a) The company is concerned about its reputation with its employees.
  - (b) The company believes in fostering the spirit of dialogue without degenerating it into a position-based debate.
  - (c) The company has some inter-personnel problems in the past due to which it felt the need for these corporate satsangs.
  - (d) All of the above
10. From Cochin to Shimla, the new culture vultures are tearing down acres of India's architectural treasures. Ancestral owners often fobbed off with a few hundred rupees for an exquisitely carved door or window, which fetches fifty times that much from foreign dealers, and yet more from the drawing room sophisticates of Europe and the US. The reason for such shameless rape of the Indian architectural wealth can perhaps, not wrongly, be attributed to the unfortunate blend of activist disunity and local indifference.

**It can be inferred from the above passage that**

- (a) The environment created by the meeting between activist disunity and local difference is ideal for antique dealers to thrive in India.
- (b) Only Indians are not proud of their cultural heritage and are hungry for the foreign currency that is easily available in return of artefacts.
- (c) Most Indian families have heirlooms which can be sold at high prices to Europeans and Americans.
- (d) India provides a rich market for unscrupulous antique dealers.

11. Three airlines IA, JA and SA—operate on the Delhi - Mumbai route. To increase the number of seats sold, SA reduces the fare and this was emulated by IA and JA immediately. The general belief was that the volume of air travel between Delhi and Mumbai would increase as a result.

**Which of the following, if true, would add credence to the general belief**

- (a) Increase in profitability of the three airlines
  - (b) Extension of the discount scheme to other routes
  - (c) A study that shows that air travellers in India are price-conscious
  - (d) A study that shows that as much as 80% of air travel in India is company-sponsored
12. Developed countries have made adequate provisions for social security for senior citizens. State insurers (as well as private ones) offer medicare and pension benefits to people who can no longer earn. In India, with the collapse of the joint family system, the traditional shelter of the elderly has disappeared. And a state faced with a financial crunch is not in a position to provide financial security. So, it is advisable that the working population give serious thought to building a financial base for itself.

**Which one of the following, if it were to happen, weakens the conclusion drawn in the above passage the most**

- (a) The insurance sector is under developed and trends indicate that it will be extensively privatized in the future.
  - (b) The insurance sector is under developed and trends indicate that it will be extensively privatized in the future.
  - (c) India is on a path of development that will take it to a developed country status, with all its positive and negative implications.
  - (d) If the working population builds a stronger financial base, there will be a revival of the joint family system.
13. Various studies have shown that our forested and hilly regions, in general, where biodiversity as reflected in the variety of flora is high, are places where poverty appears to be high. And these same areas are also the ones where educational performance seems to be poor. Therefore, it may be surmised that, even disregarding poverty status, richness in biodiversity goes hand in hand with educational backwardness.

**Which one of the following statements, if true, can be said to best provide supporting evidence for the surmise mentioned in the passage**

- (a) In regions where there is little variety in flora, educational performance is seen to be as good as in regions with high variety in flora, when poverty levels are high.
- (b) Regions which show high biodiversity also exhibit poor educational performance, at low levels of poverty.
- (c) Regions which show high biodiversity reveal high levels of poverty and poor educational performance.
- (d) In regions where there is low biodiversity, at all levels of poverty, educational performance is seen to be good.

14. Cigarettes constitute a mere 20% of tobacco consumption in India. And fewer than 15% of the 200 million tobacco users consume cigarettes. Yet these 15% contribute nearly 90% of the tax revenues to the Exchequer from the tobacco sector. The punitive cigarette taxation regime has kept the tax base narrow, and reducing taxes will expand this base.
- Which one of the following best bolsters the conclusion that reducing duties will expand the tax base?**
- The cigarette manufacturers' association has decided to indulge in aggressive promotion.
  - There is a likelihood that tobacco consumers will shift to cigarette smoking if cigarette prices were to reduce.
  - The cigarette manufacturers are lobbying for reduction on duties.
  - An increase in duties on non-cigarette tobacco may lead to a shift in favour of cigarette smoking.
15. Thomas Malthus, the British clergyman turned economist, predicted that the planet would not be able to support the human population for long. His explanation was that human population grows at a geometric rate, while the food supply grows at an arithmetic rate.
- Which one of the following, if true, would not undermine the thesis offered by Malthus?**
- Population growth can be slowed down by the voluntary choices of the individuals and not by natural disasters.
  - The capacity of the planet to feed a growing human population can be enhanced through biotechnological means.
  - Human systems and natural systems like food supply, follow natural laws of growth which have remained constant, and will remain unchanged.
  - Human beings can colonize other planetary systems on a regular and on going basis to accommodate a growing population.
16. The company's coffee crop for 1998-99 totalled 8079 tonnes, an all time record. The increase over the previous year's production of 5830 tonnes was 38.58%. The previous highest crop was 6089 tonnes in 1970-71. The company had fixed a target to be realized by the year 2000-01, and this has been achieved two years earlier, thanks to the emphasis laid on the key areas of irrigation, replacement of unproductive coffee bushes, intensive refilling and improved agricultural practices. It is now our endeavour to reach the target of 10000 tonnes in the year 2001-02.
- Which one of the following would contribute most to making the target of 10000 tonnes in 2001-02 unrealistic?**
- The potential of the productivity enhancing measures implemented up to now has been exhausted.
  - The total company land under coffee remained constant since 1969 when an estate in the Nilgiri Hills was acquired.
  - The sensitivity of the crop to climatic factors makes predictions about production uncertain.
  - The target-setting procedures in the company have been proved to be sound by the achievement of the 8000 tonne target.
17. Animals in general are shrewd in proportion as they cultivate society. Elephants and beavers show the greatest signs of this sagacity when they are together in large numbers, but when man invades their communities they lose all their spirit of industry. Among insects, the labours of the bee and the ant have attracted the attention and admiration of naturalists, but all their sagacity seems to be lost upon separation, and a single bee or ant seems destitute of every degree of industry. It becomes the most stupid insect imaginable, and it languishes and soon dies.
- Which of the following can be inferred from the above passage?**
- Humankind is responsible for the destruction of the natural habitat of the animals and insects.
  - Animals, In general, are unable to function effectively outside their normal social environment.
  - Naturalists have great admiration for bees and ants, despite their lack of industry upon separation.
  - Elephants and beavers are smarter than bees and ants in the presence of human beings.
18. In a recent report, the gross enrolment ratios at the primary level, that is the number of children enrolled in classes one to five as a proportion of all children aged 6 to 10, were shown to be very high for most states; in many cases they were way above 100 percent. These figures are not worth anything, since they are based on the official enrolment data complied from school records. They might as well stand for 'gross exaggeration ratios'.
- Which one of the following options best supports the claim that the ratios are exaggerated?**
- The definition of gross enrolment ratio does not exclude, in its numerator, children below 6 years or above 10 years enrolled in classes one to five.
  - A school attendance study found that many children enrolled in the school records were not meeting a minimum attendance requirement of 80 percent.
  - A study estimated that close to 22 children enrolled in the class one records were below 6 years of age and still to start going to school.
  - Demographic surveys show shifts in the population profile which indicate that the number of children in the age group 6 to 10 years is declining.
19. Szymanski suggests that the problem of racism in football may be present even today. He begins by verifying an earlier hypothesis that clubs' wage bills explain 90% of their performance. Thus, if players' salaries were to be only based on their abilities, clubs that spend more should finish higher. If there is pay discrimination against some group of players-fewer teams bidding for black players thus lowering the salaries for blacks with the same ability as whites-that neat relation may no longer hold. He concludes that certain clubs seem to have achieved much less than what they could have, by not recruiting black players.
- Which one of the following findings would best support Szymanski's conclusion?**
- Certain clubs took advantage of the situational hiring above-average shares of black players.
  - Clubs hired white players at relatively high wages and did not show proportionately good performance.

- (c) During the study period, clubs in towns with a history of discrimination against blacks, under performed relative to their wage bills
- (d) Clubs in one region, which had higher proportions of black players, had significantly lower wage bills than their counterparts in another region which had predominantly white players.
20. The pressure on Italy's 257 jails has been increasing rapidly. Those jails are old and overcrowded. They are supposed to hold up to 43,000 people — 9,000 fewer than now. San Vittore in Milan, which has 1,800 inmates, is designed for 800. The number of foreigners inside jails has also been increasing. The minister in charge of prisons fears that tensions may snap, and so has recommended to government an amnesty policy?
- Which one of the following, if true, would have most influenced the recommendation of the minister?**
- (a) Opinion polls have indicated that many Italians favour a general pardon.
- (b) The opposition may be persuaded to help since amnesties must be approved by a two-thirds majority in parliament.
- (c) During a recent visit to a large prison, the Pope whose pronouncements are taken seriously, appealed for 'a gesture of clemency'
- (d) Shortly before the recommendation was made, 58 prisons reported disturbances in a period of two weeks.
21. The offer of the government to make iodised salt available at a low price of one rupee per kilo is welcome, especially since the government seems to be so concerned about the ill effects of noniodised salt. But it is doubtful whether the offer will actually be implemented. Way back in 1994, the governmental methods for reducing the costs of iodisation to about five paise per kilo. But these reports have remained just those-reports on paper.
- Which one of the following, if true most weakens the author's contention that it is doubtful whether the offer will be actually implemented?**
- (a) The government proposes to save on costs by using the three methods it has already devised for iodisation.
- (b) The chain of fair-price distribution outlets now covers all the districts of the state.
- (c) Many small-scale and joint sector units have completed trials to use the three iodisation methods for regular production.
- (d) The government which initiated the earlier effort is in place even today and has more information on the effects of no-iodised salt
22. Argentina's beef cattle herd has dropped to under 50 million from 57 million ten years ago in 1990. The animals are worthless, too: prices fell by over a third last year, before recovering slightly. Most local meat packers and processors are in financial trouble, and recent years has seen a string of plant closures. The Beef producer's Association has now come up with a massive advertisement campaign calling upon Argentines to eat more beef-their "juicy, healthy, routed, plate-filling steaks."

**Which one of the following, if true, would contribute most to a failure of the campaign?**

- (a) There has been a change in consumer preference towards eating leaner meats like chicken and fish.
- (b) Prices of imported beef have been increasing, thus making locally grown beef more competitive in terms of policy.
- (c) The inability to cross breed native cattle with improved varieties has not increased production to adequate levels.
- (d) Animal rights pressure groups have come up rapidly, demanding better and humane treatment of farmyard animals like beef cattle

23. Although in the limited sense of freedom regarding appointment and internal working, the independence of the Central Bank is unequivocally ensured, the same cannot be said of its right to pursue monetary policy without co-ordination with the central government. The role of the Central Bank has turned out to be subordinate and advisory in nature.

**Which one of the following best supports the conclusion drawn in the passage?**

- (a) The decision of the chairman of the Central Bank to increase the bank rate by two percentage points sent shock waves in industry, academic and government circles alike.
- (b) Government has repeatedly resorted to monetisation of the debt despite the reservations of the Central Bank.
- (c) The central Bank does not need the central government's nod for replacing soiled currency notes.
- (d) The inability to remove coin shortage was a major shortcoming of this government.

24. ✓ The Shvets-chattra or the "White Umbrella" was a symbol of sovereign political authority placed over the monarch's head at the time of the coronation. The ruler so inaugurated was regarded not as a temporal autocrat but as the instrument of protective and sheltering firmament of supreme law. The white umbrella symbol is of great antiquity and its varied use illustrates the ultimate common basis of non-theocratic nature of states in the Indian traditions As such, the umbrella is found, although not necessarily a white one, over the head of Lord Ram, the Mohammedan sultans and Chatrapati Shivaji.

**Which of the following best summarizes the above passage?**

- (a) The placing of an umbrella over the ruler's head was a common practice in the Indian subcontinent.
- (b) The white umbrella represented the instrument of firmament of the supreme law and non-theocratic nature of Indian states.
- (c) The umbrella, not necessarily a white one, was a symbol of sovereign political authority.
- (d) The varied use of the umbrella symbolized the common basis of the non-theocratic nature of states in the Indiana tradition.

25. The theory of games is suggested to some extent by parlour games such as chess and bridge. Friedman illustrates two distinct features of these games. First in a parlour game played for money, if one wins the other (others) loses (lose). Second, these games are games involving a strategy. In a game of chess, while choosing what action is to be taken a player tries to guess how his/her opponent will react to the various actions he or she might take. In contrast, the card pastime, 'patience' or 'solitaire' is played only against chance. Which one of the following can best be described as a 'game'?

- (a) The team of Tenzing Norgay and Edmund Hillary climbing Mt. Everest for the first time in human history.
- (b) A national level essay writing competition.
- (c) A decisive war between the armed forces of India and Pakistan over Kashmir.
- (d) Oil Exporter's Union deciding on world oil prices, completely disregarding the countries which have at most minimal oil production.

26. Choose the option that best captures the essence of the text given below :

Some decisions will be fairly obvious - "no-brainers." Your bank account is low, but you have a two week vacation coming up and you want to get away to some place warm to relax with your family. Will you accept your in-laws' offer of free use of their Florida beachfront condo? Sure. You like your employer and feel ready to move forward in your career. Will you step in for your boss for three weeks while she attends a professional development course? Of course

- A. Some decisions are obvious under certain circumstances. You may, for example, readily accept a relative's offer of free holiday accommodation. Or step in for your boss when she is away.
- B. Some decisions are no brainer. You need not think when making them. Examples are condo offers from in-laws and job offers from bosses when your bank account is low or boss is away.
- C. Easy decisions are called "no-brainers" because they do not require any cerebral activity. Examples such as accepting free holiday accommodation abound in our lives.
- D. Accepting an offer from in-laws when you are short on funds and want a holiday is a no-brainer. Another no-brainer is taking the boss's job when she is away.

- |       |       |
|-------|-------|
| (a) A | (b) B |
| (c) C | (d) D |

27. Choose the option that best captures the essence of the text given below :

Physically, inertia is a feeling that you just can't move; mentally, it is a sluggish mind. Even if you try to be sensitive, if your mind is sluggish, you just don't feel anything intensely. You may even see a tragedy enacted in front of your eyes and not be able to respond meaningfully. You may see one person exploiting another, one group persecuting another, and not be able to get angry. Your energy

is frozen. You are not deliberately refusing to act; you just don't have the capacity.

- A. Inertia makes your body and mind sluggish. They become insensitive to tragedies, exploitation, and persecution because it freezes your energy and decapacitates it.
- B. When you have inertia you don't act although you see one person exploiting another or one group persecuting another. You don't get angry because you are incapable.
- C. Inertia is of two types – physical and mental. Physical inertia restricts bodily movements. Mental inertia prevents mental response to events enacted in front of your eyes.
- D. Physical inertia stops your body from moving; mental inertia freezes your energy, and stop your mind from responding meaningfully to events, even tragedies, in front of you.

- |       |       |
|-------|-------|
| (a) A | (b) B |
| (c) C | (d) D |

28. Choose the option that best captures the essence of the text given below :

Try before you buy We use this memorable saying to urge you to experience the consequences of an alternative before you choose it, whenever this is feasible. If you are considering buying a van after having always owned sedans, rent one for a week or borrow a friend's. By experiencing the consequences first hand, they become more meaningful. In addition, you are likely to identify consequences you had not even thought of before. May be you will discover that it is difficult to park the van in your small parking space at work, but that, on the other hand, your elderly father has a much easier time getting in and out of it

- A. If you are planning to buy a van after being used to sedans, borrow a van or rent it and try it before deciding to buy it. Then you may realize that parking a van is difficult while it is easier for your elderly father to get in and out of it.
- B. Before choosing an alternative, experience its consequences if feasible. If, for example, you want to change from sedans to a van, try one before buying it. You will discover aspects you may never have thought of.
- C. Always try before you buy anything. You are bound to discover many consequences. One of the consequences of going in for a van is that it is more difficult to park than sedans at the office car park.
- D. We urge you to try products such as vans before buying them. Then you can experience consequences you have not thought of such as parking problems. But your father may find vans more comfortable than cars.

- |       |       |
|-------|-------|
| (a) A | (b) B |
| (c) C | (d) D |

**DIRECTIONS (Qs. 29 - 40) : Attempt these questions based on the information given against each.**

29. In order to qualify in an examination having 6 subjects, a student has to get at least 50% and above marks separately in any 4 subjects and 35% and above in each of the 6 subjects.

If a total of 25% candidates have qualified in the examination, then which of the following is definitely true?

- (a) 50% of the students got 50% and above in 4 subjects but only half of them could get 35% and above in all the subjects.
- (b) 75% of the students could not get at least 35% marks in all the 6 subjects taken together.
- (c) 25% of the students have secured 50% and above in all the 6 subjects.
- (d) At least 25% of the students could get at least 35% and above marks in each of the subjects.

30. "Cases of food-poisoning have been reported from village X. After a dinner party arranged for 100 people, 68 were admitted to the hospital, and 36 were reported to be out of danger. The food, which was cooked and stored in an open space for almost 12 hours, was served after reheating. Investigation is going on."

A news report.

Which of the following can be hypothesised from the above information?

- (a) Cases of food-poisoning need to be handled carefully.
- (b) Stale food is likely to be the cause of food-poisoning.
- (c) Late-night dinner parties for a large number of people result in food-poisoning.
- (d) Cases of food-poisoning are not reported in urban dinner parties.

31. "If you want a hassle-free holiday package for city M, then join only our tour. Hurry up; only a few seats available" – An advertisement of XYZ Tourist Company.

If the above statement is true then which of the following has been assumed while making the statement?

- (a) No seats may be available with other tour operators for city M.
- (b) Nowadays people have a lot of money to spend on their comforts.
- (c) Travel packages offered by other tour operators are neither cheap nor comfortable.
- (d) Many people desire convenience and comfort while going for a holiday.

32. The State Government's agency 'Housewell' has constructed 500 flats for the middle class but inspite of a shortage of houses, it has not even received 100 applications.

Which of the following, if true, could explain this?

- (a) A private builder's scheme which has come up on the adjacent plot is overbooked in spite of higher cost and 100% advance payment.
- (b) The flats are not accessible either by bus or by train.
- (c) The quality of construction of 'Housewell' is reported to be very poor.

(d) The cost and conditions of payment are quite demanding and are slightly higher than the usual government housing schemes.

33. The burning of coal, oil and other combustible energy sources produces carbon dioxide, a natural constituent of the atmosphere. Elevated levels of carbon dioxide are thought to be responsible for half the greenhouse effect. Enough carbon dioxide has been sent into the atmosphere already to cause a significant temperature increase. Growth in industrial production must be slowed, or production processes must be changed. Which of the following, if true, would tend to weaken the strength of the above conclusion?

- (a) Many areas of the world are cold anyway, so a small rise in temperature would be welcome.
- (b) Carbon dioxide is bad for health.
- (c) Most carbon dioxide is emitted by automobiles.
- (d) Industry is switching over to synthetic liquid fuel extracted from coal.

34. Psychological research indicates that college hockey and football players are more quickly moved to hostility and aggression than are college athletes in non-contact sports such as swimming. But the researchers' conclusion—that contact sports encourage and teach participants to be hostile and aggressive—is untenable. The football and hockey players were probably more hostile and aggressive to start with, than the swimmers. Which of the following, if true, would most strengthen the conclusion drawn by the psychological researchers?

- (a) The football and hockey players became more hostile and aggressive during the season and remained so during the off season, whereas there was no increase in aggressiveness among the swimmers.
- (b) The football and hockey players, but not the swimmers, were aware at the start of the experiment that they were being tested for aggressiveness.
- (c) The same psychological research indicated that the football and hockey players had a great respect for cooperation and team play, whereas the swimmers were most concerned with excelling as individual competitors.
- (d) The research studies were designed to include no college athletes who participated in both contact and non-contact sports.

35. For our nation to compete successfully in the high technology enterprises of the future, workers with skills in maths and science will be needed. But it is doubtful that they will be available, since there is a shortage of high school maths and science teachers that shows no signs of improving. Industry can help alleviate this problem by funding scholarship grants and aid to college students who graduate in maths and science with the hope of pursuing teaching careers. Which of the following, if true, would most probably prevent the proposed plan from achieving its intended effect?

- (a) After graduation from college, most maths and science graduates opt for jobs in industry rather than in teaching.
- (b) Many high schools have been forced to lower their standards in hiring maths and science teachers.
- (c) More scholarship money is already available for students of maths and science than is available for those in any other field.
- (d) Population statistics show that the number of high school students is expected to decline over the next ten years.
36. Some scientists believe that, in certain species of birds, actual particles of metal within the brain react to the Earth's magnetic field in the same way as the needle in a compass. It is this mechanism that is thought to underlie the birds' amazing ability to navigate accurately over distances of thousands of miles by day and night during migration. To test this theory, researchers surgically removed the metal particles from the heads of some birds and then released them, along with a number of untreated birds, at the usual time and place of their annual winter migration. Which of the following results would most seriously weaken the theory being tested?
- (a) The untreated birds were confused by the erratic flight patterns of the surgically treated birds and failed to migrate successfully.
- (b) The surgically treated birds were able to follow their usual flight patterns successfully by day, but not by night.
- (c) The surgically treated birds were able to migrate about as accurately as the untreated birds.
- (d) The surgically treated birds were able to migrate successfully only when closely following a group of untreated birds.
37. The argument for liberalisation which answers the worries of the Left parties about the possible trade deficits created by the opening up of the Indian economy goes thus: 'In today's economic scenario, where there are many trading countries, the trade between two specific countries need not be balanced. The differing demands of goods and services and the differing productive capabilities of the same among different countries will cause a country like India to have trade deficits with some countries and surpluses with other countries. On the whole, the trade deficits and surpluses will balance out in order to give a trade balance'. Which of the following conclusions best summarises the argument presented in the passage above?
- (a) Left parties need not worry about trade deficits in India since its trade will always be in balance even though it runs a deficit with a single country.
- (b) India's trade deficits and surpluses with other countries always balance out.
- (c) The Left parties in India should not be concerned about India's trade deficits with specific countries because they will balance out in the long run.
- (d) None of these
38. Most citizens are very conscientious about observing a law when they can see the reason behind it. For instance, there has been very little need to actively enforce the recently implemented law that increased the penalty for godmen duping people of their money by playing with their emotions. This is because citizens are very conscientious about duping someone in the name of religion, as it leaves their religious gurus with a bad name.
- Which of the following statements would the author of this passage be most likely to believe?
- (a) The increased penalty alone is a significant motivation for most citizens to obey the law.
- (b) There are still too many inconsiderate citizens in the society.
- (c) Godmen should not be allowed to play with the emotions of the people.
- (d) Society should make an effort to teach citizens the reasons for its laws.
39. Inflation can only be fundamentally caused by two factors— supply side factors and demand side factors. These factors are either reductions in the supply of goods and services or increase in demand due to either the increased availability of money or the reallocation of demand. Unless other compensating changes also occur, inflation is bound to result if either of this occurs. In economies prior to the introduction of banks (a pre-banking economy) the quantity of money available, and hence, the level of demand, was equivalent to the quantity of gold available. If the statements above are true, then it is also true that in a pre-banking economy:
- (a) any inflation would be the result of reductions in the supply of goods and services.
- (b) if other factors in the economy are unchanged, increasing the quantity of gold available would lead to inflation.
- (c) if there is a reduction in the quantity of gold available, then, other things being equal, inflation would result.
- (d) whatever changes in demand occur, there would be compensating changes in the supply of goods and services.
40. Most large retail stores of all goods and brands hold discount sales in the month of November. The original idea of price reduction campaigns in November became popular when it was realized that the sales of products would generally slow down following the Diwali rush. The lack of demand could be solved by the simple solution of reducing prices. There is now an increasing tendency among major chains of stores across the country to have their "November sales" begin before Diwali. The idea behind this trend is to endeavour to sell the maximum amount of stock at a profit, even if that may not be at the maximum profit.
- Which of the following conclusions *cannot* be drawn from the above?

- (a) The incidence of "early" November sales results in lower holdings of stocks with the corollary of lower stock holding costs.  
 (b) Demand is a function of price; as you lower price, demand increases.  
 (c) Major stores seem to think it makes sense to have the November sales campaigns pre-Diwali.  
 (d) The major department stores do not worry as much about profit maximization as they do about sales maximization.
- DIRECTIONS (Qs. 41-47) :** Answer these questions independent of each other.
41. The cost of housing in many urban parts of India has become so excessive that many young couples, with above-average salaries, can only afford small apartments. EMI and rent commitments are so huge that they cannot consider the possibility of starting a family since a new baby would probably mean either the mother or father giving up a well-paid position – something they can ill afford. The lack of or great cost of child-care facilities further precludes the return of both parents to work.  
 Which of the following adjustments could practically be made to the situation described above which would allow young couples to improve their housing prospects?  
 (a) Encourage couples to have one child only.  
 (b) Encourage couples to remain childless.  
 (c) Encourage young couples to move to cheaper areas for living.  
 (d) None of these is likely to have an impact on the current situation.
42. In a famous experiment at the IISc campus, when a cat smelled milk, it salivated. In the experiment, a bell was rung whenever food was placed near the cat. After a number of trials, only the bell was rung, whereupon the cat would salivate even though no food was present. Such behaviour has been observed in other animals such as dogs, monkeys, etc. and is a vital input for training domesticated animals. Which of the following conclusions may be drawn from the above experiment?  
 (a) The ringing of a bell was associated with food in the mind of the cat.  
 (b) Cats and other animals can be easily tricked.  
 (c) A conclusion cannot be reached on the basis of one experiment.  
 (d) Two stimuli are stronger than one.
43. Chewing tobacco has many benefits. However, the primary benefits occur in the area of mental health. The habit originates in a search for contentment. The life expectancy of our people has increased greatly in recent years; it is possible that the relaxation and contentment and enjoyment produced by tobacco chewing has lengthened many lives. Hence, chewing tobacco is beneficial.
- Which of the following, if true, would weaken the above conclusion?  
 (a) The evidence cited in the statement covers only one example of the effects of tobacco chewing.  
 (b) The government earns millions of rupees from the sales of chewing tobacco.  
 (c) There is as yet no statistical evidence to prove a link between chewing and longevity.  
 (d) None of these.
44. A mail-order company recently had a big jump in clothing sales after hiring a copywriter and a graphic artist to give its clothing catalog a magazine-like format designed to appeal to a more upscale clientele. The company is now planning to launch a housewares catalog using the same concept. The company's plan assumes that  
 (a) An upscale clientele would be interested in a housewares catalog  
 (b) Other housewares catalogs with magazine-like formats do not already exist  
 (c) The same copywriter and graphic artist could be employed for both the clothing and housewares catalogs  
 (d) Customers to whom the old clothing catalog appealed will continue to make purchase from catalogs with the new format
45. Some people have questioned the judges objectivity in cases of sex discrimination against women. But the record shows that in sixty percent of such cases, the judges have decided in favour of the women. This record demonstrates that the judges have not discriminated against women in cases of sex discrimination against women.  
 The argument above is flawed in that it ignores the possibility that  
 (a) Many judges find it difficult to be objective in cases of sex discrimination against women  
 (b) A large number of the judges' cases arose out of allegations of sex discrimination against women  
 (c) The judges are biased towards women defendants or plaintiffs in cases that do not involve sex discrimination  
 (d) The majority of the cases of sex discrimination against women that have reached the judges' courts have been appealed from a lower court
46. A famous singer recently won a lawsuit against an advertising firm for using another singer in a commercial to evoke the famous singer's well known rendition of a certain song. As a result of the lawsuit, advertising firms will stop using imitators in commercials. Therefore, advertising costs will rise, since famous singers' services cost more than those of their imitators. The conclusion above is based on which of the following assumptions?

- (a) Commercials using famous singers are usually more effective than commercials using imitators of famous singers  
 (b) Most people are unable to distinguish a famous singer's rendition of a song from a good imitator's rendition of the same song  
 (c) The original versions of some well-known songs are unavailable for use in commercials  
 (d) The advertising industry will use well-known renditions of songs in commercials
47. Whenever a major airplane accident occurs, there is a dramatic increase in the number of airplane mishaps reported in the media, a phenomenon that may last for as long as a few months after the accident. Airline officials assert that the publicity given the gruesomeness of major airplane accidents focuses media attention on the airline industry, and the increase in the number of reported accidents is caused by an increase in the number of news sources covering airline accidents, not by an increase in the number of accidents.
- Which of the following if true, would seriously weaken the assertions of the airline officials?
- (a) Airline accidents tend to occur far more often during certain peak travel months  
 (b) The publicity surrounding airline accidents is largely limited to the country in which the crash occurred  
 (c) News organisations do not have any guidelines to help them decide how severe an accident is  
 (d) Airplane accidents receive coverage by news sources only when the news sources find it advantageous to do so
- DIRECTIONS (Qs. 48-51) :** In these questions, four alternative summaries are given below each text. Choose the option that best captures the essence of the text.
48. You seemed at first to take no notice of your school fellows, or rather to set yourself against them because they were strangers to you, they knew as little of you as you did of them; this would have been the reason for their keeping aloof from you as well, which you would have felt as a hardship. Learn never to conceive a prejudice against others because you know nothing of them. It is bad reasoning, and makes enemies of half the world. Do not think ill of them till they behave ill to you; and then strive to avoid the faults which you see in them. This will disarm their hostility sooner than pique of resentment or complaint.
- (a) You encountered hardship amongst your school-fellows because you did not know them well. You should learn to not make enemies because of your prejudices irrespective of their behaviour towards you.  
 (b) The discomfort you felt with your school-fellows was because both sides knew little of each other. Avoid prejudice bad behaviour from others, and then win them over by shunning the faults you have observed.
- (c) The discomfort you felt with your school-fellows was because both sides knew little of each other. You should not complain unless you find others prejudiced against you and have attempted to carefully analyse the faults you have observed in them.  
 (d) You encountered hardship amongst your school-fellow because you did not know them well. You should learn to not make enemies because of your prejudices unless they behave badly with you.
49. The human race is spread all over the world, from the polar regions to the tropics. The people of whom it is made up eat different kinds of food, partly according to the climate in which they live, and partly according to the kind of food which their country produces. In hot climates, meat and fat are not much need; but in the Arctic regions they seem to be very necessary for keeping up the heat of the body. Thus, in India, people live chiefly on different kinds of grains, eggs, milk, or sometimes fish and meat. In Europe, people eat more meat and less grain. In the Arctic region; where no grains and fruits are produced, the Eskimo and other races live almost entirely on meat and fish.
- (a) In hot countries, people eat mainly grains while in the Arctic, they eat meat and fish because they cannot grow grains.  
 (b) Hot climates require people to eat grains while cold regions require people to eat meat and fish.  
 (c) Food eaten by people in different regions of the world depends on the climate and produce of the region, and varies from meat and fish in the Arctic to predominantly grains in the tropics.  
 (d) While people in Arctic regions like meat and fish and those in hot regions like Indian prefer mainly grains, they have to change what they eat depending on the local climate and the local produce.
50. Although, almost all climate scientists agree that the Earth is gradually warming, they have long been of two minds about the process of rapid climate shifts within larger periods of change. Some have speculated that the process works like a giant oven or freezer, warming or cooling the whole planet at the same time. Others think that shifts occur on opposing schedules in the Northern and Southern Hemispheres, like exaggerated seasons. Recent research in Germany examining climate patterns in the Southern Hemisphere at the end of the last Ice Age strengthens the idea that warming and cooling occurs at alternate times in the two hemispheres. A more definitive answer to this debate will allow scientists to better predict when and how quickly the next climate shift will happen.
- (a) Research in Germany will help scientists find a definitive answer about warming and cooling of the Earth and predict climate shifts in the future in a better manner.

- (b) Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; finding a definitive answer will help them better predict climate shift in future.
- (c) Scientists have been unsure whether rapid shifts in the Earth's climate happen all at once or on opposing schedules in different hemispheres; research will help find a definitive answer and better predict climate shift in future.
- (d) More research rather than debates on warming or cooling of the Earth and exaggerated seasons in its hemispheres, will help scientists in Germany predict climate changes better in future.

51// Local communities have often come in conflict with agents trying to exploit resources, at a faster pace for an expanding commercial-industrial economy. More often than not, such agents of resource- intensification are given preferential treatment by the state, through the grant of generous long leases over mineral of fish stocks, for example, of the provision of raw material at an enormously subsidized price. With the injustice so compounded, local communities at the receiving end of this process, have no resource except direct action, resisting both' the state and outside exploiters through a variety of protest techniques. These struggles might perhaps be seen as a manifestation of a new kind of class conflict.

- (a) Preferential treatment given by the state to agents of resource-intensification for an expanding commercial-industrial economy exacerbates injustice to local communities and leads to direct protests from them, resulting in a new type of class conflict.
- (b) The grant of long leases to agents of resource intensification for an expanding commercial industrial economy leads to direct protests from the local community, which sees it as unfair.
- (c) A new kind of class conflict arises from preferential treatment given to agents of resource intensification by the state , which the local community sees as unfair.
- (d) Local communities have no option but to protest against agents of resource- intensification and create a new type of class conflict when they are given raw material at subsidized prices for an expanding commercial-industrial economy.

# SOLUTIONS

1. (a) The argument is essentially that the proposed law makes no sense because knitting needles are dangerous as well. The argument relies explicitly on an analogy between hypodermic and knitting needles. Thus, the two must be similar in all respects relevant to the argument. Otherwise, the argument is unconvincing. (a) affirms that knitting needles are in fact dangerous, thereby affirming the analogy between the two types of needles.
- (b) and (c) each in its own way supports the bare assertion that the proposed law might not be effective. However, none of these answer choices affirms the argument's essential reasoning.
- (d) actually *weakens* the argument, by providing a reason why hypodermic needles and knitting needles are *not* relevantly similar.
2. (d) The argument relies on the unstated assumption that no other event since the picnic could have caused the outbreak instead. Statement (d) provides some evidence that the employees who have reported disporella symptoms in fact contracted disporella at least one week ago. Accordingly, (d) helps support the claim that it was the food served at the picnic two weeks ago that caused the outbreak. Admittedly, (d) would provide even stronger support if it indicated that symptoms never appear until one week after contamination. Nevertheless, (d) is the best of the five answer choices.
- (a) has no effect on the argument. It is the time after contamination that symptoms begin to occur, *not* the duration of those symptoms, that is key to identifying the source of contamination.
- (b) actually *weakens* the claim, by providing another possible explanation for the outbreak. Specifically, (b) provides for the possibility that the outbreak can be attributed to food served in the company's cafeteria rather than at the picnic.
- (c) provides *some* support for the argument, insofar as it helps to explain why only a few of those reporting symptoms have tested positive so far. However, the spokesperson's claim is not just that the 120 employees have disporella but that it was the picnic food that caused the outbreak. (c) helps show that the 120 employees have disporella, but does not help explain how they contracted disporella. For this reason (d) is a better choice than (c).
3. (a) The argument's premises boil down to the following:
1. Wendy is a student who plays backgammon.
  2. All students play either chess or checkers, but no backgammon player plays checkers.
- Based on these premises we can conclude that Wendy plays chess. In order to also conclude that Wendy understands chess strategy, we must assume that all chess players understand chess strategy:
- Premise:* X is an A.
- Assumption:* All A's are B's.
- Conclusion:* X is a B.
- Statement (a) provides the assumption needed to draw the conclusion.
4. (b) The argument relies on the unstated assumption that prenatal care results in better health and therefore less cost to society. (b) helps affirm this assumption.
- (a) is irrelevant to the argument, which makes no distinction between undocumented immigrants and other immigrants.
- (c) actually renders the statistics *more* surprising, by providing evidence that prenatal care will add to society's economic burden.
- (d) also renders the statistics *more* surprising, by providing evidence that the cost of the prenatal care program will *not* be offset by a particular health benefit—a benefit which would lessen the taxpayers' economic burden.
5. (c) The argument boils down to the following, including the unstated assumption provided by (c):
- Premise:* Students get enough reading practice already.
- Unstated assumption (c):* The reading program provides only reading practice.
- Conclusion:* The reading program is unnecessary.
- (a) is not a necessary assumption. The argument is not concerned with whether improved reading skills would help the students learn history and science. Rather, the argument involves whether the new program would help improve reading skills.
- (b) is not a necessary assumption. The argument is that no additional reading practice is needed, regardless of which program provides that practice.
- (d) is not a necessary assumption. The argument does not aim to compare the importance of one discipline over another.
6. (d) Assuming the number of viable competitors has increased during the last two years, the likely result would be to draw circulation away from already viable newspapers, including the most profitable one. Given that profitability depends primarily on advertising revenues and therefore on circulation, (d) actually exacerbates the discrepancy between the two statements.

- (a) help explain why the most profitable newspaper remains most profitable even though its circulation is declining: Advertisers have not yet begun to switch because the most profitable newspaper is still the most widely circulated.
- (b) helps explain the discrepancy. Although the argument provides that advertisers are more likely to advertise with widely circulated newspapers than with others, it is entirely possible that other factors, such as advertising rates that a newspaper charges, also affect which newspapers advertisers choose.
- (c) helps explain the discrepancy, by identifying another source of revenue and therefore another means of enhancing profitability. Simply stated, the more sources of revenue the more profitable a newspaper is likely to be. This in turn helps explain why the most profitable newspaper in the city remains the most profitable one, despite declining circulation. Admittedly, as circulation decreases so does subscriber revenue, and thus overall profitability. Yet the newspaper's profitability is still greater than it would be without revenue from its subscribers.
7. (d) Choice (d) is correct because it neatly summarizes the main theme of the passage. We can instantly eliminate answer choice (a) because the passage never states how the increased penalty affects citizens. Choice (b) is too extreme, and overly negative. Besides, the overall theme of the passage is positive; the negative tone of choice (b) is out of keeping with it. Answer choice (c) is incorrect because the author stated only that adherence to the law would prevent the price of gasoline from rising further. He never said that this action would *lower* gas prices.
8. (a) (a) is the correct choice as the passage says that "efficiency is present everywhere, this makes it all pervading". The passage does not suggest that efficiency does not pay or can be more of a torture.
9. (b) (b) is the only option as according to the passage designations can be forgotten and even a subordinate like a sales engineer can question the CEO.
10. (a) The passage refers to disunity of activists and local indifference to India's architectural treasures. Thus (a) comes across as a best choice as a situation it created in which antique dealers can thrive. Other options are clearly not suggested may appear correct but is not at apt as (a).
11. (a) Sentence (a) is evidently clear, as the passage very clearly mentions that as the number of seats sold would increase, so the profit would increase.
12. (d) (d) comes across the right choice, as according to the passage, the working population needs a stronger financial base, since the joint family system is collapsing and thus the elderly are not being given the traditional shelter and the state can't provided it as it faces a financial crunch. Thus (d) is contrary to the conclusion drawn from the passage.
13. (c) (c) is the only correct choice, which can be inferred from the passage that high biodiversity goes hand in hand with poverty and poor educational performance.
14. (a) The tax base is narrow.
- ∴ the taxes are high, only those smoking expensive cigarettes pay taxes. If however taxes are reduced and cigarettes are cheaper more tobacco consumers will shift to cigarettes thus increasing the tax base.
15. (b) (b) is the correct option as according to the passage Thomas Malthus predicted that human population would outgrow food supply, thus it can be inferred that only biotechnological means would enhance the capacity of the planet to feed the growing human population. The artificial means to increase food supply does not undermine Malthus thesis.
16. (a) (a) is the best option as according to the passage the achievement of the 8000 tonne target was made two years earlier. Now, the achievement of 10000 tonnes would be unrealistic as the company would have exhausted all the enhancing measures implementing.
17. (b) (b) comes across as the only logical inference from the passage where it is shown that animals in general can function when they are in their normal social environment as explained through the examples of bees, ants, elephant & beavers who cannot work properly when separated or invaded by humans
18. (c) (c) is the best option as it shows that children below 6 years of age were enrolled in class I, the age interval does not fit into this level, thus the ratio is exaggerated.
19. (b) Inferring from the passage (b) supports Szymanski's conclusion because the passage suggests that clubs that had spent more on hiring white players should have finished higher. However, there is pay discrimination. So high pay may not mean good performance.
20. (d) (d) is the only choice which make sense since the Minister in charge of prisons would be influenced by incidence of disturbance as he had already fears of tensions snapping and have recommended an amnesty policy to his government.
21. (c) (c) is the correct option as according to the passage the low price of one rupee per kilo can be brought about by small scale and joint sector units which have already completed trials for regular production. If the small scale sector can produce iodised salt at cheaper rate then selling the salt can be made practical through these sectors at a large scale.
22. (c) (c) contributes most to the failure of the campaign because if production is not raised to adequate levels, and if cross bred varieties are not successfully brought about, there would be a lesser number of people eating beef. The passage mentions the drop in the cattle herd as the reason for this trouble. So if the drop continues the campaign will fail.

23. (a) (a) is the only option that make sense as the passage categorically mentions that the Central Bank does not have the right pursue a monetary policy without coordination with the central government.
24. (d) (d) best summarises the passage as can be inferred from the passage that the varied use of the Umbrella symbol illustrates the common bases of non-theocratic nature of states and represents the instrument of fermentation of supreme law as mentioned in the passage.
25. (b) According to the passage only (b) can be described as a game because, it is fulfilling both the features illustrated by Friedman i.e. in the competition one will win and the other lose and writing an essay involves a strategy.
26. (a) (a) comes across is the only reasonable option as the decisions to be taken in the passage are fairly obvious i.e. with a low bank account a free holiday offer may be taken up or if we are ready to move forward in our career then we can step in for the boss, when she is away. A is the most appropriate choice as its mentions that some decision are obvious under certain circumstances while other options.
27. (b) (b) is the correct choice because according to the passage having inertia means we are incapable of doing anything. Eventhough we may see one person exploiting another, or a group persecuting another.
28. (b) (b) is the only option as the passage clearly means to say that one should experience the consequences before choosing an alternative as then they become more meaningful. Also one can discover aspects one may not have ever thought of. Other options are more specifically about the van, whereas the point of the passage is to make a general statement about trying alternatives with van as an example.
29. (d) Since 25% candidates have qualified that means atleast those must have fulfilled one of the criteria of having secured 35% and above in each of the subjects.
30. (d) It is mentioned that food was stored in open for almost twelve hours hence stale food could have been the reason behind the disaster.
31. (d) The use of word 'hassle-free' suggests that the company assumed that people seek convenience and comfort.
32. (d) The flats are constructed for the middle class and if the prices are higher then it is obvious that they are not going to buy it.
33. (a) It is clear from 3rd and 4th sentences of passage.
34. (d) Option (d) is essential for basic conclusion.
35. (a) The "Hope of pursuing" is shattered if option (a) happens.
36. (c) Option (c) would most seriously weaken theory being tested because it negates the study completely.
37. (d) The first statement uses the word 'always', which makes it out of context as per the argument presented. Similarly the second statement is useless as it also uses the word 'always'. The third statement is not correct as it talks only about the trade deficit only and surplus is not mentioned.
38. (d) The opening sentence provides the cue to solving this problem, which clearly says that the citizens will definitely obey a law if they understand the reason behind its imposition. So the society should make an effort to teach citizens the reasons for its laws.
39. (b) As inflation is a result of increase in the availability of money (or gold in the pre-banking economy) so (c) is wrong and (b) is correct. (d) is wrong as it is out of context of the passage. (a) is wrong as it talks of 'any inflation' and leaves the inflation caused by increase in demand. This would have been correct if the option had mentioned that other factors remain unchanged.
40. (c) Statement (a) is true as the goods will be sold earlier so the cost of stocking will be reduced. (b) is clearly true as is directly mentioned in the passage. (d) is correct as it is clear from the last sentence of the passage that even a small profit is good enough for these stores. Only (c) conclusion can not be drawn from the passage.
41. (a) None of the options (a), (b) and (c) can improve the housing prospects of young couples. (a) is not correct as even bearing one child could lead the mother or father giving up her/his job. Further it might be difficult to get back the similar job. (b) is not correct as it offers no solution but puts an end to their family plans. (c) is not correct as shifting to cheaper areas for living will lead to poor standard of living which they would not like to maintain.
42. (b) This passage is a typical example of Response to Stimuli. Clearly the cat starts salivating when the bell runs because she has related the ringing of bell with food in the back of her mind.
43. (a) The paragraph doesn't mention any statistical evidence to prove a link between chewing tobacco and longevity of life. It must be the situation that the ideas given in the paragraph are opinion of the author.
44. (a) The mail-order company received a tremendous response with the help of magazine-like format catalog designed for the upscale clientele. As the company is planning to launch a housewares catalog on the similar concept, the clear cut assumption which the company is making that the upscale clientele would be interested in a housewares catalog also.
45. (a) The record that 60% of judges have decided in favour of the women doesn't prove that the judges have not discriminated against women in cases of sex discrimination against women. There might be a possibility that there is a set of judges who are not objective in cases of sex discrimination against women,

- thus making the record equivalent to 60%. Hence we can say that there are some judges who have discriminated against women in cases of sex discrimination against women.
46. (b) A lot of advertisement firms use imitators in commercials to evoke some famous singer's renditions of certain songs. The firms do so because they believe that people are unable to distinguish a famous singer's rendition of a song from a good imitator's rendition of the same song.
47. (c) The airline officials asserts that the increase of the number of reported accidents is caused by an increase in the number of new sources covering airline accidents and not by an increase number of accidents. The above assertion weakens if (a) is true. There might be a situation when in some peak travel months lot of accidents have occurred and the media has reported the same because of which the number of reported accidents have increased.
48. (b) It is the correct choice. It best summarises the points made in the passage and the advice given. The other options state one or the other thing incorrectly. In (a) the second statement is clearly wrong. In (c) & (d) statement 1 covers only one aspect of the passage. In second statement, 'learn to not make enemies' is not talked about in the passage.
49. (c) (a) is clearly the correct option. (b), (c) and (d) are only inferences but not the summary. (a) covers the complete scope of the passage. It offers the essence or the thematic of the passage while others merely offer citations.
50. (b) Option (b) is the answer because it talks about scientists being unsure about rapid shifts in earth's climate and how finding a definitive answer will help them to predict the future climatic changes. Option (a) cannot be the answer as it talks about research in general and the paragraph gives more emphasis on finding a "definitive answer" in terms of climate change. Option (c) is not considered as it gives emphasis only on research done in Germany. Option (d) is also ruled out because it specifically gives more importance to scientists of Germany.
51. (a) (c) is the most appropriate option. Option (a) doesn't talk about the expanding commercial-industrial economy. (b) does not explain the effect of the struggles i.e. 'a new conflict', (d) is not correct as it talks specifically only of raw materials for expanding economy. Further it says local communities are creating new type of conflict, which is wrong.

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