

GENERAL APTITUDE

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REASONING



Analogy

Q. Pen : Pencil : Ink ::

- A. Orange : Banana : Juice B. Table : Chair : Carpenter
C. Cow : Milk : Curd D. Fish : Shark : Water

Ans : A



Analogy

Q. Planet : Orbit :: Projectile : ?

A. Track B. Path C. Milky Way D. Trajectory

Ans : D



Analogy

Q. 25 : 37 :: 49 : ?

A. 41 B. 56 C. 60 D. 65

Ans : D



Analogy

Q4. 5 : 35 ::

A. 7 : 77 B. 9 : 45 C. 11 : 55 D. 3 : 24

Ans : A



Analogy(Assignment)

Q1. $8 : 256 :: ?$

A. $7 : 343$ B. $9 : 243$ C. $10 : 500$ D. $5 : 75$

Ans C

Q2. $8 : 28 :: 27 : ?$

A. 8 B. 28 C. 64 D. 65

Ans D

Q3. $3 : 11 :: 7 : ?$

A. 22 B. 29 C. 18 D. 51

Ans D



Analogy(Assignment)

Q1. Newspaper : Press :: Cloth : ?

A. Tailor B. Textile C. Factory D. Mill

Ans D

Q2. Train : Track ::

A. Idea : Brain B. Bullet : Barrel
C. Water : Boat D. Fame : Television

Ans B

Q3. Fear : Threat :: Anger : ?

A. Compulsion B. Panic C. Provocation D. Force

Ans C



Odd One out

Q. Find the odd one out –

A. Sprinkle - Pour

B. Happiness - Merriment

C. Mist – Fog

D. Sad – Unhappy

Ans : D



Odd One out

Q. Find the odd one out:

A. 263 B. 111 C. 551 D. 383

Ans : D



Odd One out

Q. Find the odd one out -

- | | |
|---------------------|--------------------|
| A. Newspaper-Editor | B. Film – Director |
| C. Car – Driver | D. Book - Author |

Ans : C



Odd One out(Assignment)

Q1. A. Curd B. Butter C. Oil D. Cheese

Ans C

Q2. A. POCG B. KLIZ C. BUDX D. FMQV

Ans D

Q3. A. 751 B. 734 C. 981 D. 862

Ans A

Q4. A. 12 B. 25 C. 37 D. 64

Ans C



Coding Decoding(A-Z)

Q. In a coded language “SHOWER” is coded as “RHWOES”. What is the code for “FATHER”?

A. RHAEFT B. RAHTEF C. RTHAEF D. THAREF

Ans : B



Coding Decoding(A-Z)

Q. If “PATHOLOGY” is coded as “HTAPOYGOL”, then what is the code for “PROGRAMME”?

- A. GORPREMMA B. GOREPRMMA
C. GORREPMMA D. ROGEPRMMA

• **Ans : A**



Coding Decoding(Assignment)

Q1. BANK : CBOL :: GROVE : _____

A. SPOMP B. HSPWF C. EVORG D. PSWFH

Ans : B

Q2. LARGE : NCTIG :: QUIET : _____

A. SWKGV B. GKVWS C. RPQMN D. TEIUG

Ans A



Puzzle Test

Q. If 'yellow' means 'green', 'green' means 'white', 'white' means 'red', 'red' means 'black', 'black' means 'blue' means 'violet', which of the following represents the colour of human blood?

- A. Black B. Violet C. Red D. Blue
- E. None of these

Ans : E



Puzzle Test

Q. If 'paper' is called 'wood', 'wood' is called 'straw', 'straw' is called 'grass', 'grass' is called 'rubber' and 'rubber' is called 'cloth', what is furniture made up of -

A. grass

B. straw

C. wood

D. paper

Ans: B



Seating Arrangement(Linear)

Q. A, B, C, D, E, F & G are sitting on a wall all facing east. C is immediate to the right of D. B is at an extreme end and has E as his neighbor. G is between E and F. D is sitting third from the south end. Who are D's neighbors?

A. C,E

B. A,C

C. C,F

D. A,F

Ans: C

B
E
G
F
D
C
A



Seating Arrangement(Circular)

Q. A group of 8 members sit in a circle facing towards the centre. D is between A & F & is opposite to G. E is to the right of A but on the left of C, whose right hand neighbour is G. B has H to his left & F to his right.

Who is diagonally opposite to A?

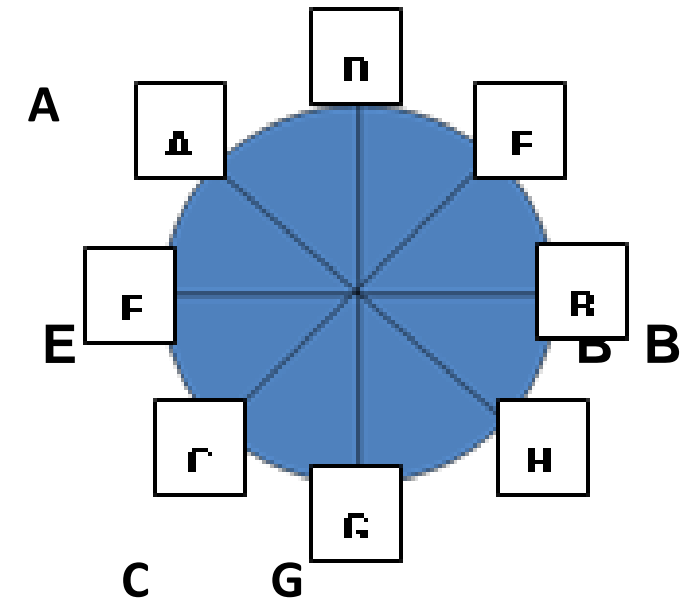
A. B B. F C. G D. H

Ans: D

Who is to the right of D?

A. B B. G C. A D. H

Ans: C



Seating Arrangement(circular)(Assignment)

Q. Six friends are playing a card game on a round table. Subodh is to the right of Prabodh. There is one person between Sudha and Uma. Prabir is between Subodh & Uma & second to the left of Alok.

Who is to the right of Sudha?

A. Prabodh B. Uma C. Alok D. Prabir

Ans : A

Who is diagonally opposite of Prabir?

A. Prabodh B. Uma C. Sudha D. Prabir

Ans : C



Arrangement(Matrix)

Q. There are 6 friends A,B,C,D,E & F. Each one is proficient in one of the games, namely, Badminton, Volleyball, Cricket, Hockey, Tennis & Polo. Each owns a different colored car, namely, yellow, green, black, white, blue & red. D plays Polo & owns a yellow car. C does not play either Tennis or Hockey & owns neither Blue nor Yellow car. E owns a White car & plays Badminton. B does not play Tennis, he owns a Red car. A plays Cricket & owns a Black car.

Q1. Who plays Volleyball?

- A. B B. C C. F D. Data Inadequate

Ans : B

Q2. What is the color of F's car?

- A. Green B. Blue C. Red D. Either Green or Blue.

Ans : B



Coding Decoding

Q. If in a certain language "sing and play" is coded as "ra pa le", "I play football" is coded as "pa se fa" and "she can sing" is coded as "te ra ba" then what is the code for the word "and" in the code language?

A. le B. se C. fa D. te

Ans : A



Coding Decoding(Assignment)

Q. Study the given information and select the most appropriate term for 'save more money'

'time and money' is coded as 'tis nim jes'

'manage money judiciously' is coded as 'lop xer nim'

'save more time' is coded as 'jes kib dob'

'save enough judiciously' is coded as 'xer kib hix'.

A. nim hix kib

B. jes nim dob

C. kib nim dob

D. none of these

Ans: C

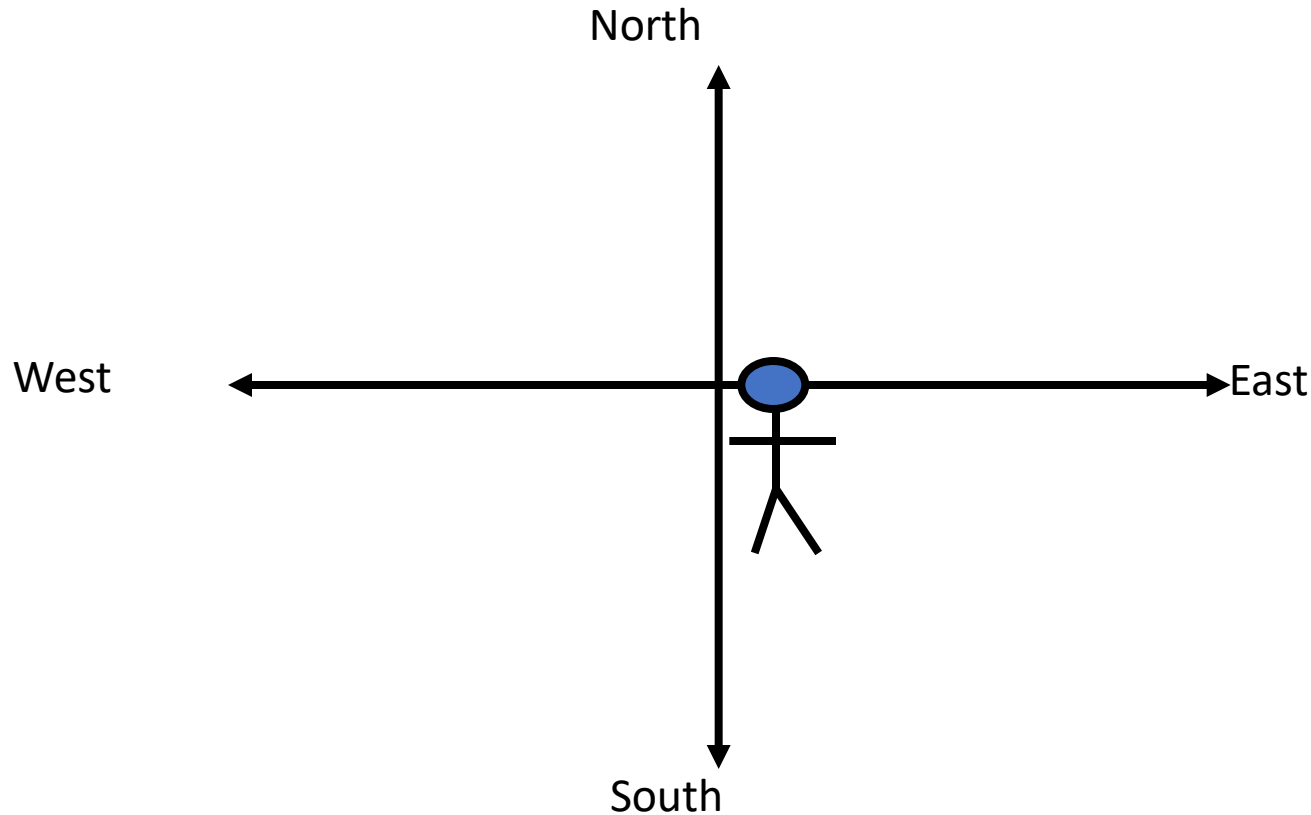


Directions

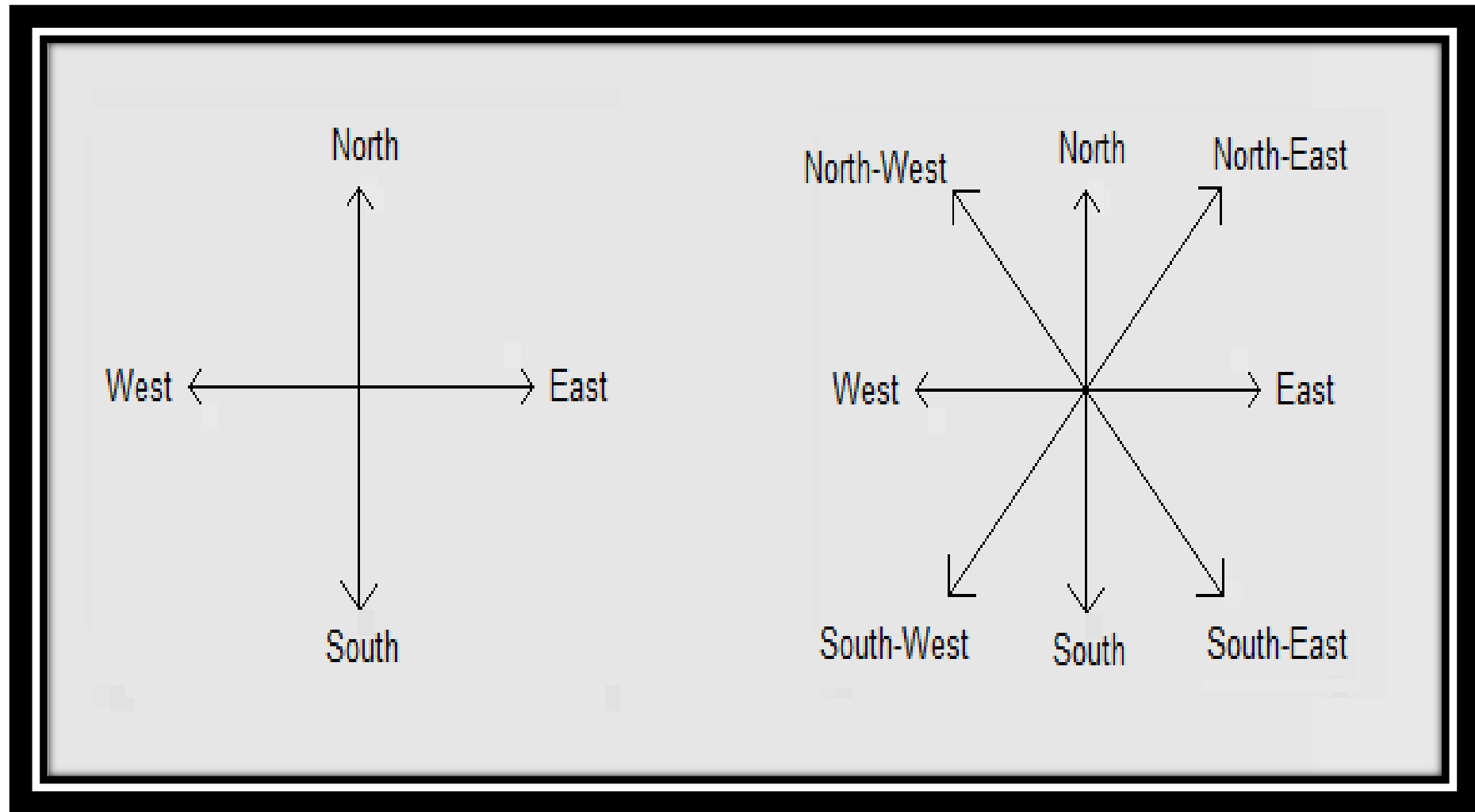
The key to solving these problems is getting your directions right.

It is the person's right or left not yours. The key is to think that you are walking as per the directions given in place of the man.

Visualize.



Directions



Directions

Q. A walks 10m in front and 10m to the right. Then every time turning to his left, he walks 5, 15 and 15m respectively. How far is he now from his starting point and facing in which direction?

- A. 5m south B. 15m north
C. 5m north D. 15m south

Ans : A



Directions

Q. I start walking towards east and after 35 metres turn right and walk another 15 metres and again turn right and walk further 15 metres and stop. What is the minimum distance I have to walk to get to my starting point?

- A. 25 metres B. 30 metres C. 35 metres D. 20 metres

Ans: A

By Pythagoras Theorem –

$$\sqrt{(20^2 + 15^2)} = \sqrt{400 + 225} = \sqrt{625} = 25$$



Directions(Assignment)

- Q. Starting from a point x Ramu walked 25 meters towards the west he turned to his left and walked 30 meters he then turned to his left and walked 25 meters he then further turned to his right and walked 12 meters how far is Ramu from the point x and in which direction?
- A. 42 m south B. 47 m east C. 42 m north D. 27 m south

Ans : A



Directions (Assignment)

Q. A walks southwards then turns right, then right again and then left and again left. In which direction is he from his starting point if he walked the same distance in before each turn?

- A. North-west B. South-east C. South-west D. South

Ans: C



Directions(Assignment)

Q. I am facing East. Turning to the right I go 20 m, then turning to the left I go 20 m and turning to the right I go 20 m, then again turning to the right I go 40 m and then again I go 40 m to the right. In which direction am I from my original position?

A. North

B. West

C. South

D. East

Ans : B



Blood Relation

List of different types of relations to solve questions based on Blood Relationships.

Relationship	Terms
Father's son or mother's son	Brother
Father's daughter or mother's daughter	Sister
Mother's brother (younger or elder)	Maternal Uncle
Father's brother (younger or elder)	Uncle (Paternal)
Father's sister (younger or elder)	Aunt
Mother's sister (younger or elder)	Aunt
Son's wife	Daughter-in-law
Daughter's husband	Son-in-law
Sister's husband	Brother-in-law
Husband's brother or wife's brother	Brother-in-law
Brother's wife	Sister-in-law
Husband's sister or wife's sister	Sister-in-law
Husband's father or wife's father	Father-in-law
Husband's mother or wife's mother	Mother-in-law
Brother's son or sister's son	Nephew



Blood Relation

Q. 'P+Q' means P is the brother of Q

'PXQ' 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'?

A. $T \times S + M - K$

B. $T + M \times S - K$

C. $K - S \times M + T$

D. $T \times M + S - K$

Ans : B



Blood Relation

Q. $A + B$ means A is the son of B;
 $A - B$ means A is the wife of B;
 $A \times B$ means A is the brother of B;
 $A \div B$ means A is the mother of B; and
 $A = B$ means A is the sister of B.
What does $P = R \div Q$ mean ?

- a. P is the aunt of Q.
- b. P is the sister of Q.
- c. Q is the niece of P.
- d. Q is the daughter of P.

Ans: a



Blood Relations

Q. P and Q are sisters and R and S are brothers. P's daughter is S's sister. How is Q related to R?

- A. Aunt
- B. Niece
- C. Nephew
- D. Grandmother

Ans: A



Blood Relations(Assignment)

1. $A + B$ means A is the brother of B
2. $A \times B$ means A is the father of B
3. $A \div B$ means A is the mother of B

Which of the following would mean "G is the son of H"?

- A. $H \times I \times G$
- B. $H + G \times I$
- C. $H \div G \div I$
- D. $H \times G + I$

Ans: D



Blood Relations(Assignment)

Q. Pointing to a girl, Kirti Said, “She is the daughter of my brother’s wife”.
How is the girl related to Kirti?

- A. Nephew
- B. Niece
- C. Sister-in-law
- D. Mother
- E. None of these

Ans: B



Blood Relations(Assignment)

Q. Pointing to a boy in the photograph, Monika said, “His sister is the only daughter of my father”. How is the boy related to Monika’s father?

- A. Nephew
- B. Father
- C. Son
- D. Brother
- E. None of these

Ans: C



Data Sufficiency

Q. What day is the fourteenth of a given month?

I. The last day of the month is a Wednesday.

II. The third Saturday of the month was seventeenth.

A. if the data in statement I alone are sufficient

B. if the data in statement II alone are sufficient

C. if the data even in both the statement together are not sufficient

D. if the data in both the statements together are sufficient.

Ans : B



Data Sufficiency(Assignment)

- Q. You must submit your application within 10 days from, the date of release of this advertisement." What is the exact date before which the application must be submitted?
- I. The advertisement was released on 18th February.
- II. It was a leap year.
- a. If the data in statement I alone are sufficient.
- b. If the data in statement II alone are sufficient.
- c. If the data either in statement I alone or in statement II alone are sufficient.
- d. If the data given in both the statements I and II together are not sufficient.
- Answer: a



ENGLISH



Idioms & Phrases

Q. Identify the meaning of **the idiom/phrase** from the given options-
To be successful in today's world, we require the '**gift of the gab**'.

- A. Ability to speak well
- B. Good interpersonal skills
- C. Divine help and guidance
- D. A fierce competitive spirit

Ans : A

(the ability to speak easily and confidently in a way that makes people want to listen to you and believe you)



Idioms & Phrases

Q. Identify the meaning of **the idiom/phrase** from the given options-

His arguments '**cut no ice with me**'.

A. had no influence on me

B. did not hurt me

C. did not benefit me

D. did not make me proud

Ans : A

(to have no influence on someone/ to fail to convince someone / I don't care who you are)



Idioms & Phrases

Q. Identify the meaning of the idiom/phrase from the given options-

We planned for the dinner at the eleventh hour, so we decided to have a '**pot-luck dinner**'.

- a. dinner where every-body brings something to eat
- b. dinner where everybody pays for his food
- c. dinner where only soup is served
- d. dinner where people eat and play games at the same time

Ans: a

(**Potluck dinners** are events where the attendees bring a dish to a **meal**.)



Idioms & Phrases

Q. Identify the meaning of the idiom/phrase from the given options-

There was a job for me to '**cut my teeth on**'.

- a. to gain experience
- b. to try
- c. to sharpen my wits
- d. to earn a decent salary

Ans: a

(acquire initial practice or experience of a particular sphere of activity)



Subject and Predicate

- Every complete sentence contains two parts: a **subject** and a **predicate**. The **subject** is what (or whom) the sentence is about, while the **predicate** tells us something about the **subject**.
- Example –
- The **subject** of the **sentence** is what (or whom) the **sentence** is about. In the **sentence** “The cat is sleeping in the sun,” the word cat is the **subject**. A **predicate** is the part of a **sentence**, or a clause, that tells what the **subject** is doing or what the **subject** is.



Articles

- For vowels prefix it with AN article
- For consonants prefix it with A
- The **U** in **university** is pronounced with a long 'u' sound which sounds like 'yew', So, although the letter is a vowel, it is not pronounced like one in 'university' because it does not have a vowel sound. We therefore say '**a university**'.
- The **U** in **umbrella** is pronounced as a vowel and so we use 'an'. We therefore say '**an umbrella**'.
- This rule also applies to the use of consonants.
- The word hour has a soft 'h' which is weakly pronounced and therefore we say 'an hour'.
- If the word has a hard 'h', like house, we use 'a' (a house).



Articles

- **CASE 1**

- The article *A* is used before singular, [countable nouns](#) which begin with [consonant](#) sounds.
- Examples:
- He is **a** teacher.
- She doesn't own **a** car.
- I saw **a** bear at the zoo.

- **CASE 2**

- The article *AN* is used before singular, [countable nouns](#) which begin with [vowel](#) sounds.
- Examples:
- He is **an** actor.
- She didn't get **an** invitation.
- I saw **an** eagle at the zoo.

- **CASE 3**

- Remember that *A(AN)* means "one" or "a single". You cannot use *A(AN)* with plural nouns.
- Examples:
- I saw **a** bears in Yellowstone National Park. *Not Correct*
- I saw bears in Yellowstone National Park. *Correct*



Articles

- **CASE 4**
- **The** is used to refer to specific or particular nouns;
- **a/an** is used to modify non-specific or non-particular nouns.
- We call **the** the definite article and a/an the indefinite article.
- For example, if I say, "Let's read the book," I mean a specific book.



Articles

Q. Choose the alternative which has correct sequence of articles-

Rama entered _____ shop. _____ owner received him. He looked at _____ things in the shop. Finally he purchased _____ umbrella.

- a. the /a /a /an
- b. a /the /the /an
- c. a /an /the /an
- d. the /a /an /the

Answer: b



Articles

Q. _____ Mettur dam is _____ old multipurpose project of _____ South Indian state of Tamil Nadu across _____ Cauvery river.

- a. a /an /no article/the
- b. the /an /the /the
- c. an /a /the /no article
- d. no article /a /the /an

Answer: b



Articles(Assignment)

Q. Choose the alternative which has correct sequence of **articles**-

In the evening _____ stranger walked towards _____ sea. _____
roaring sea was with big waves and _____ old man was seen there.

A. the, a, the, a

B. the, a, the, an

C. a, the, the, an

D. a, a, a, an

Ans : C



Correct Sequence of Sentences

Q. It is the responsibility of parents to teach the young moral values in life.

P. Many children take advantage of their parents' busy schedule.

Q. This results in children's ignorance of social values.

R. The reason behind it is that parents are quite busy nowadays.

S. Nowadays parents spend very meagre time with children

Which one of the following is the correct sequence?

A. SRPQ

B. PQRS

C. SQRP

D. SPQR

Answer: D



Correct Sequence of Sentences(Assignment)

Q. I am sure

P: and will be happy

Q: sooner or later

R: a day will come

S: when all will be equal

The correct sequence should be

A. QPRS B. QSRP C. RQSP D. RSQP

Ans : C



Preposition

- A preposition is a word (usually a short word) that shows the relationship between two other nearby words.
- It is used to show a relationship between the noun and pronoun in a sentence.
- The word *preposition* means *positioned before*. A preposition will sit before a word (a [noun](#) or a [pronoun](#)) to show that word's relationship to another nearby word.



Preposition

- List of Common Prepositions -

above, about, across, against, along, among, around, at, before, behind, below, beneath, beside, between, beyond, by, down, during, except, for, from, in, inside, into, like, near, of, off, on, since, to, toward, through, under, until, up, upon, with, within



Preposition

Q. Complete the sentence with appropriate word (preposition)-

The book comprises _____ seven lessons.

- a. of
- b. no preposition
- c. for
- d. in

Answer: b



Preposition

Q. Complete the sentence with appropriate word (preposition)-

The most popular therapy _____ getting rid _____ hiccups is to have someone to scare you when you least expect it.

a. to, away

b. of , of

c. for, of

d. on, to

Answer: c



Preposition(Assignment)

Q. Complete the sentence with appropriate word (preposition)-

_____ a friend's house _____ a village suddenly I was awakened _____ a rumbling and thumping _____ the roof.

A. in , by , on , at

B. on , in , at , by

C. at , in , by , on

D. by , at , on , in

Ans: C



Spotting Errors

- Q. Identify the part of the sentence with error-
- A. The journalist along with
 - B. the camera crew were
 - C. kidnapped by the
 - D. militants last night.
 - E. No error

Ans: B



Active & Passive Voice

Q. Select the one which best expresses the given sentence in Passive/Active voice-

Before festivals the shops are thronged with men, women and children making various purchases.

- A. During festivals people throng the shops.
- B. Men, women and children throng the shops before festivals making various purchases.
- C. Men, women and children make purchases during festivals.
- D. The shops are thronged by people making purchases.

Ans: B



Passive/Active voice(Assignment)

Q. Select the one which best expresses the given sentence in Passive/Active voice-

Who gave you permission to enter?

- a. By whom were you given permission to enter?
- b. By whom was you given permission to enter?
- c. By whom you were given permission to enter?
- d. By whom given you permission to enter?

Answer: a



Passive/Active voice(Assignment)

Q. Select the one which best expresses the given sentence in Passive/Active voice-
The Principal has granted him a scholarship.

- A. A scholarship has granted to him by the Principal
- B. He has been granted a scholarship by the Principal
- C. He has granted a scholarship by the Principal
- D. A scholarship was granted to him by the Principal

Answer: B



Grammatically correct

Q. Choose the grammatically correct option.

- A. Mobifirst's switch to responsive layout has greatly enhanced it's user experience
- B. Mobifirst's switch to responsive layout has greatly increased it's user experience
- C. Mobifirst's switch to responsive layout has greatly enhanced its user experience
- D. Mobifirst's switch to responsive layout has greatly increased its user experience

Answer: C



Sentence Correction

Q. **He firmly belief** is that Yoga is the permanent solution to any disease.

- A. His firmly belief
- B. He firmly believes
- C. His firm belief
- D. He is firm in belief
- E. None of these

Answer: C



Verb

- A **verb** is a word for an action or a state of being.

Explanation:

- VERB

Examples of action [verbs](#) are: walk, talk, think, see, eat, find, believe, sit.

Examples of verbs that relate a state of being are: am, are, is, will, was, were.

Verbs can work together, this function is called an *auxiliary* or *helping* verb, for example:

- I *am* walking.
- We *were* talking.
- I *will* see.



Adverb

- An **adverb** is a word used to modify a verb, an adjective, or another adverb.

- **Explanation:**

- **ADVERB**

An adverb is used to show degree, manner, place, or time of the verb, adjective, or another adverb that it modifies.

Examples of adverbs are: very, slowly, nearly, often, never, strangely, not.

Example use of adverbs:

- We were *not* talking. (modifies the verb 'were talking')
- Today is *very* hot. (modifies the adjective 'hot')
- I was walking *very* slowly. (modifies the adverb 'slowly')



Adjective

- An **adjective** is a word used to describe a noun.

- **Explanation:**

- **ADJECTIVE**

Most adjectives used to describe nouns have degrees:

- Positive degree = hot, small, strange, heavy, pretty.
- Comparative degree = hotter, smaller, stranger, heavier, prettier.
- Superlative degree = hottest, smallest, strangest, heaviest, prettiest.

Example use of adjectives.

- She wore a *pretty* dress. (describes the noun 'dress')
- The *smaller* children ride a school bus. (describes the noun 'children')
- We saw the *strangest* sight. (describes the noun 'sight')



Nouns

- A noun is a word for a person, place, or thing. Everything we can see or talk about is represented by a word that names it. That "naming" word is called a *noun*.

Often a noun will be the name for something we can touch (e.g., *lion, cake, computer*), but sometimes a noun will be the name for something we cannot touch (e.g., *bravery, mile, joy*).

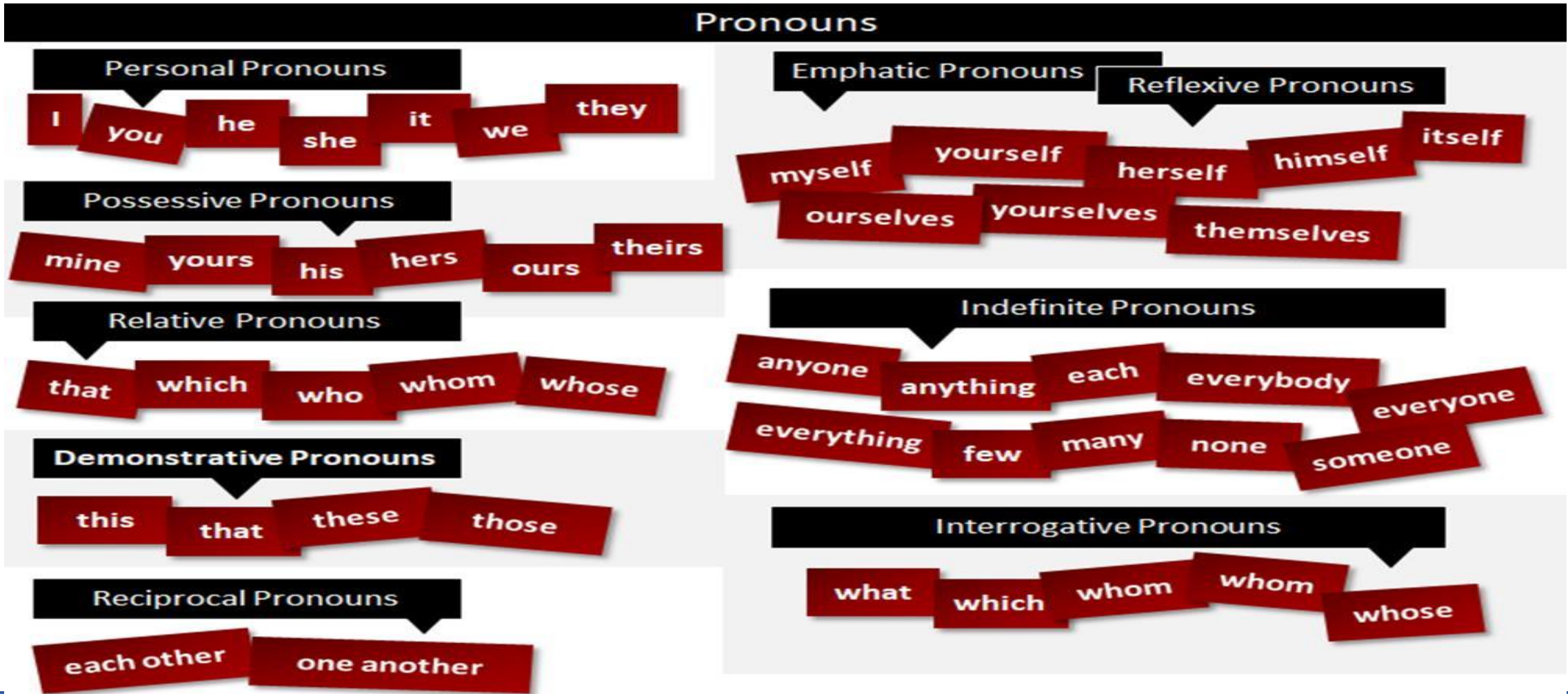
Everything is represented by a word that lets us talk about it. This includes people (e.g., *man, scientist*), animals (e.g., *dog, lizard*), places (e.g., *town, street*), objects (e.g., *vase, pencil*), substances (e.g., *copper, glass*), qualities (e.g., *heroism, sorrow*), actions (e.g., *swimming, dancing*), and measures (e.g., *inch, ounce*).

- **Easy Examples of Nouns**
- **People:** soldier, Alan, cousin, lawyer
- **Animals:** aardvark, rat, shark, Mickey
- **Places:** house, London, factory, shelter
- **Things:** table, London Bridge, chisel, nitrogen, month, inch, cooking
- **Ideas:** confusion, kindness, faith, Theory of Relativity, joy



Pronouns

- Pronouns replace nouns. If we didn't have pronouns, we'd have to keep repeating our nouns and that would make our sentences cumbersome and repetitive. Pronouns are usually short words.



Reading Comprehension

Q. The passage below is accompanied by a set of questions. Choose the best answer to each question.

Punctually at midday he opened his bag and spread out his professional equipment, which consisted of a dozen cowrie shells, a square piece of cloth with obscure mystic charts on it, a note book, and a bundle of Palmyra writing.

His forehead was resplendent with sacred ash and vermilion, and his eyes sparkled with a sharp abnormal gleam which was really an outcome of a continual searching look for customers, but which his simple clients took to be a prophetic light and felt comforted.

The power of his eyes was considerably enhanced by their position placed as they were between the painted forehead and the dark whiskers which streamed down his cheeks: even a half-wit's eyes would sparkle in such a setting.

To crown the effect, he wound a saffron-coloured turban around his head.

This colour scheme never failed. People were attracted to him as bees are attracted to cosmos or dahlia stalks.



Reading Comprehension

Q. From the description of this passage one can make out the person to be a

- a. snake charmer
- b. footpath vendor
- c. astrologer
- d. priest

Answer: c



Reading Comprehension

Q. The eyes of the person described sparkled because

- a. he was sitting under midday sun
- b. he was always looking for possible clients
- c. his forehead was bright with ash and vermillion
- d. he was full of joy

Answer: b



Reading Comprehension

- Q. The person opened his bag
- a. to search for something he needed
 - b. to indicate the start of his work
 - c. to take out things for display
 - d. both (b) and (c)

Answer: d



Reading Comprehension

Q. The tone of the description is

- a. sad
- b. neutral
- c. ironic
- d. sympathetic

Answer: b



Reading Comprehension

Q. What does the word 'whisker' mean in context of the passage?

- a. A faint noise
- b. A very small distance or space
- c. A long projecting hair or bristle growing from the face/snout of many mammals.
- d. None of the above

Answer: c



Permutation & Combination

- What is permutation?
- It is the number of ways a group of things can be arranged.

E.g: Consider 3 letters A,B,C . In how many ways they can be arranged?

- A B C
 - A C B
 - B A C
 - B C A
 - C A B
 - C B A
- 6 ways to arrange these 3 letters

- For 3 letter / 4 letter words its possible .but for more number of letters we need a formula-
- $nPr = \frac{n!}{(n-r)!}$



Permutation & Combination

Q. Consider 4 letters A,B,C,D and arrange them in 3 spaces

- - - 3 spaces

No . Of letters = 4

No of spaces = 3

$$nPr = 4P_3 = \frac{4!}{(4-3)!} = \frac{4!}{1!} = 4! = 4 \times 3 \times 2 \times 1 = 24 \text{ ways it can be arranged}$$

Q. Arrange 7 letters A,B,C,D,E,F,G in 4 spaces

- - - - 4 spaces

$$nPr = 7P_4 = \frac{7!}{(7-4)!} = \frac{7!}{3!} = \frac{5040}{6} = 840$$



Permutation & Combination - Remember

$$1! = 1$$

$$2! = 2 \times 1 = 2$$

$$3! = 3 \times 2 \times 1 = 6$$

$$4! = 4 \times 3 \times 2 \times 1 = 24$$

$$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

$$6! = 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$$

$$7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 5040$$



Difference between permutation and combination

- ***"My fruit salad is a combination of apples, grapes and bananas"*** We don't care what order the fruits are in, they could also be "bananas, grapes and apples" or "grapes, apples and bananas", its the same fruit salad. – combination (order does not matter)
- ***"The combination to the safe is 472"***. Now we **do** care about the order. "724" won't work, nor will "247". It has to be exactly **4-7-2**. – Permutation (When the order **does** matter)



Difference between permutation and combination

What is permutation?

Permutation: The various ways of arranging a given number of things by taking some or all at a time are all called as permutations.

Permutation includes word formation, number formation, circular permutation, etc. **In permutation, objects are to be arranged in particular order.** It is denoted by ${}^n P_r$ or $P(n, r)$.

Example: Arrange the given 3 numbers 1, 2, 3 by taking two at a time.

Now these numbers can be arranged in 6 different ways: **(12, 21, 13, 31, 23, 32).**

Here,

12 and 21, 13 and 31 or 23 and 32 do not mean the same, because here order of numbers is important.



Difference between permutation and combination

- **What is combination?**

Combination: Each of different groups or selections formed by taking some or all number of objects is called a combination.

Combination is used in different cases which include team/group/committee.

In combination, objects are selected randomly and here order of objects doesn't matter. It is denoted by ${}^n C_r$ or $C(n, r)$ or ${}^n C_r = {}^n C_{(n-r)}$.

Example: If we have to select two girls out of 3 girls X, Y, Z, then find the number of combinations possible.

Now only two girls are to be selected and arranged. Hence, this is possible in 3 different ways: **(XY, YZ, XZ,).**

Here,
You cannot make a combination as XY and YX, because these combinations mean the same.



Permutation & Combination

Q. Out of 100 balls we choose 98 balls

Note – used if no. of ball we need to choose is less (instead of reducing 98 times we just subtract $100 - 98$)

$${}^{100}C_{98} = {}^{100}C_{2}$$

$${}^{100}C_2 = \frac{100 \times 99}{1 \times 2} = 4950$$

Q. Out of 200 balls we choose 197 balls

$${}^{200}C_{197} = {}^{200}C_3$$

$${}^{200}C_3 = \frac{200 \times 199 \times 198}{1 \times 2 \times 3} =$$



Permutation & Combination

Q. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?

- A. 360
- B. 480
- C. 720
- D. 5040
- E. None of these

Ans : C



Permutation & Combination

Q. In how many different ways can the letters of the word 'CORPORATION' be arranged so that the vowels always come together?

- A. 810
- B. 1440
- C. 2880
- D. 50400
- E. 5760

Ans : D



Permutation & Combination

Q. In how many ways can the letters of the word 'LEADER' be arranged?

- A. 72
- B. 144
- C. 360
- D. 720
- E. None of these

Ans : C



Permutation & Combination

Q. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

A. 210

B. 1050

C. 25200

D. 21400

E. None of these

Ans : C



Permutation & Combination

Q. How many 3-digit numbers can be formed from the digits 2, 3, 5, 6, 7 and 9, which are divisible by 5 and none of the digits is repeated?

- A. 5 B. 10 C. 15 D. 20

Ans: D



Permutation & Combination

Q. In how many different ways can the letters of the word 'DETAIL' be arranged in such a way that the vowels occupy only the odd positions?

- A. 32
- B. 48
- C. 36
- D. 60
- E. 120

Ans: C



Permutation & Combination

Q. How many 4-letter words with or without meaning, can be formed out of the letters of the word, 'LOGARITHMS', if repetition of letters is not allowed?

- A. 40
- B. 400
- C. 5040
- D. 2520

Ans: C



Permutation & Combination

Q. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?

- A. 159 B. 194 C. 205 D. 209 E. None of these

Soln:

(1 boy and 3 girls) or (2 boys and 2 girls) or (3 boys and 1 girl) or (4 boys).

$$= ({}^6C_1 \times {}^4C_3) + ({}^6C_2 \times {}^4C_2) + ({}^6C_3 \times {}^4C_1) + ({}^6C_4)$$

$$= ({}^6C_1 \times {}^4C_1) + ({}^6C_2 \times {}^4C_2) + ({}^6C_3 \times {}^4C_1) + ({}^6C_2) \quad \rightarrow \text{using } {}^nC_r = {}^nC_{(n-r)} \text{ (to reduce calculation)}$$

$$= (6 \times 4) + \left(\frac{6 \times 5}{2 \times 1} \times \frac{4 \times 3}{2 \times 1} \right) + \left(\frac{6 \times 5 \times 4}{3 \times 2 \times 1} \times 4 \right) + \frac{6 \times 5}{2 \times 1}$$

$$= (24 + 90 + 80 + 15)$$

$$= 209$$

Ans: D



Permutation & Combination(Assignment)

Q. In how many different ways can the letters of the word 'MATHEMATICS' be arranged so that the vowels always come together?

- A. 10080
- B. 4989600
- C. 120960
- D. None of these

Ans: C



Permutation & Combination(Assignment)

Q. In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together?

- A. 120
- B. 720
- C. 4320
- D. 2160
- E. None of these

Ans: B



Permutation & Combination(Assignment)

Q. How many Permutations of the letters of the word APPLE are there?

A.600 B.120 C.240 D.60

Ans: D



Permutation & Combination(Assignment)

Q. How many different words can be formed using all the letters of the word ALLAHABAD?

A.7560

B.7890

C.7650

D. None of these

Ans: A



Permutation & Combination(Assignment)

Q. Find the value of ${}^{50}P_2$

- A. 4500
- B. 3260
- C. 2450
- D. 1470

Ans : C



Permutation & Combination(Assignment)

Q. How many words can be formed by using letters of the word 'DELHI'?

- a. 50
- b. 72
- c. 85
- d. 120

Ans : D



Permutation & Combination(Assignment)

Q. Find the number of ways the letters of the word 'RUBBER' can be arranged?

- A. 450
- B. 362
- C. 250
- D. 180

Ans: D



Permutation & Combination(Assignment)

Q. Out of 5 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?

- A. 60
- B. 200
- C. 5230
- D. 7200

Ans : D



Permutation & Combination(Assignment)

Q. In how many ways can a group of 5 men and 2 women be made out of a total of 7 men and 3 women?

- A. 63
- B. 90
- C. 126
- D. 45
- E. 135

Ans: A



Permutation & Combination(Assignment)

Q. From a group of 7 men and 6 women, five persons are to be selected to form a committee so that at least 3 men are there on the committee. In how many ways can it be done?

- A. 564 B. 645 C. 735 D. 756 E. None of these

Ans: D



Permutation & Combination(Assignment)

Q. How many distinct words can be formed by rearranging the letters of the word ENGINEER that begin with 'G' and end with 'R'?

A. 24 ways

B. 48 ways

C. 60 ways

D. 120 ways

Ans: C



THANK YOU

