

## CAT2002 Original Paper with Solutions

### SECTION – I (DI) Number of Questions: 50

**Directions for questions 1 to 6:** Answer the questions independent of each other.....

1. Four students (Ashish, Dhanraj, Felix and Sameer) sat for the Common Entrance Exam for Management (CEEM). One student got admission offers from three National Institutes of Management (NIM), another in two NIMs, the third in one NIM, while the fourth got none. Below are some of the facts about who got admission offers from how many NIMs and their educational background.
  - i) The one who is an engineer didn't get as many admissions as Ashish.
  - ii) The one who got offer for admissions in two NIMs isn't Dhanraj nor is he a chartered accountant.
  - iii) Sameer is an economist.
  - iv) Dhanraj isn't an engineer and received more admission offers than Ashish.
  - v) The medical doctor got the most number of admission offers.

Which one of the following statements is necessarily true?

- (1) Ashish is a chartered accountant and got offer for admission in three NIMs.
  - (2) Dhanraj is a medical doctor and got admission offer in one NIM.
  - (3) Sameer is an economist who got admission offers in two NIMs.
  - (4) Felix who is not an engineer did not get any offer for admission.
2. Five boys went to a store to buy sweets. One boy had Rs.40. Another boy had Rs.30. Two other boys had Rs.20 each. The remaining boy had Rs.10. Below are some more facts about the initial and final cash positions.
  - (i) Alam started with more than Jugraj.
  - (ii) Sandeep spent Rs.1.50 more than Daljeet.
  - (iii) Ganesh started with more money than just only one other person.
  - (iv) Daljeet started with  $\frac{2}{3}$  of what Sandeep started with.
  - (v) Alam spent the most, but did not end with the least.
  - (vi) Jugraj spent the least and ended with more than Alam or Daljeet.
  - (vii) Ganesh spent Rs.3.50.
  - (viii) Alam spent 10 times more than what Ganesh did.

In the choices given below, all statements except one are false. Which one of the following statement can be true?

- (1) Alam started with Rs.40 and ended with Rs.9.50.
  - (2) Sandeep started with Rs.30 and ended with Re.1.00.
  - (3) Ganesh started with Rs.20 and ended with Rs.4.00.
  - (4) Jugraj started with Rs.10 and ended with Rs.7.00.

3. In a hospital there were 200 Diabetes, 150 Hyperglycaemia and 150 Gastro-enteritis patients. Of these, 80 patients were treated for both Diabetic and Hyperglycaemia. Sixty patients were treated for Gastro-enteritis and Hyperglycaemia, while 70 were treated Diabetes and Gastro-enteritis. Some of these patients have all the three diseases. Doctor Dennis treats patients with only Diabetes. Doctor Hormis treats patients with only Hyperglycaemia and Doctor Gerard treats patients with only Gastro-enteritis. Doctor Paul is a generalist. Therefore, he can treat patients with multiple diseases. Patients always prefer a specialist for their disease. If Dr. Dennis had 80 patients, then the other three doctors can be arranged in terms of the number of patients treated as:
  - (1) Paul > Gerard > Hormis
  - (2) Paul > Hormis > Gerard
  - (3) Gerard > Paul > Hormis
  - (4) None of these

4. Three children won the prizes in the Bournvita Quiz contest. They are from the schools: Loyola, Convent and Little Flower, which are located at different cities. Below are some of the facts about the schools, the children and the city they are from.
  - One of the children is Bipin.
  - Loyola School's contestant did not come first.
  - Little Flower's contestant was named Riaz.
  - Convent School is not in Hyderabad.
  - The contestant from Pune took third place.
  - The contestant from Pune is not from Loyola School.
  - The contestant from Bangalore did not come first.
  - Convent School's contestant's name is not Balbir.

Which of the following statement is true?

- (1) 1<sup>st</sup> prize: Riaz (Little Flowers), 2<sup>nd</sup> prize: Bipin (Convent), 3<sup>rd</sup> prize: Balbir (Loyola)
  - (2) 1<sup>st</sup> prize: Bipin (Convent), 2<sup>nd</sup> prize: Riaz (Little Flowers), 3<sup>rd</sup> prize: Balbir (Loyola)
  - (3) 1<sup>st</sup> prize: Riaz (Little Flowers), 2<sup>nd</sup> prize: Balbir (Loyola), 3<sup>rd</sup> prize: Bipin (Convent)
  - (4) 1<sup>st</sup> prize: Bipin (Convent), 2<sup>nd</sup> prize: Balbir (Loyola), 3<sup>rd</sup> prize: Riaz (Little Flowers)

5. Two boys are playing on a ground. Both the boys are less than 10 years old. Age of the younger boy is equal to the cube root of the product of the age of the two boys. If we place the digit representing the age of the younger boy to the left of the digit representing the age of the elder boy, we get the age of the father of the younger boy. Similarly, if we place the digit representing the age of the elder boy to the left of the digit representing the age of the younger boy and divide the figure by 2, we get the age of mother of the younger boy. The mother of the younger boy is younger to his father, by 3 years. Then, what is the age of the younger boy?
  - (1) 3
  - (2) 4
  - (3) 2
  - (4) None of these

6. Flights A and B are scheduled from an airport within the next one hour. All the booked passengers of the two flights are waiting in the boarding hall after check-in. The hall has a seating capacity of 200, out of which 10% remained vacant. 40% of the waiting passengers are ladies. When boarding announcements were made, passengers of flight A left the hall and boarded the flight. Seating capacity of each flight is two-third of the passengers who waited in the waiting hall for both the flights put together. Half the passengers who boarded flight A are women. After boarding flight A, 60% of the waiting hall seats became empty. For every twenty of those who are still waiting in the hall for flight B, there is one airhostess in flight A. What is the ratio of empty seats in flight B to number of airhostesses in flight A?
- (1) 10 : 1    (2) 5 : 1    (3) 20 : 1    (4) 1 : 1

### Solutions for questions 1 to 6:

The following information is given:

Names	NIMs	Education
A		X Engr. X Dr.
D	X2	X Engr.
F		
S		Eco.

Also,

- (i) Ashish > Engr.
- (ii) 2 NIMs  $\neq$  D, C.A
- (iii) D  $\neq$  Engr. and D > A
- (iv) Dr. = 3

As neither A nor D is the engineer, F is the engineer. Also, as D > A > F, hence A  $\neq$  0, 3. Also, A can't be the Dr. Hence, A must be the C.A and D must be the Dr., which means that F must be the Engineer. A is a C.A., hence does not have 2 admissions hence A = 1.

By similar deductions, we get the following arrangements:

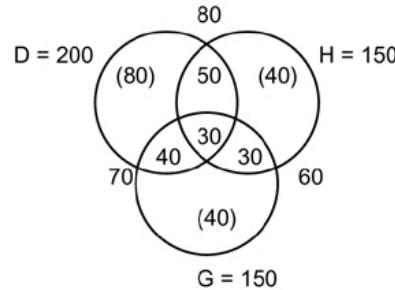
	NIMs	Education
Ashish	1	C.A.
Dhanraj	3	Dr.
Felix	0	Engr
Sameer	2	Eco.

1. Hence, only the 3<sup>rd</sup> statement is necessarily true.  
Choice (3)
2. As per the given statements, we get the following arrangement:

	Initial	Spent	Final
Alam	40	35	5
Jugraj	10	Least	J > A/D
Sandeep	30	(1.5 + D)	
Daljeet	20		
Ganesh	20	3.5	16.5

- From (iii), Ganesh = 20  
 From (iv), Daljeet = 20 and Sandeep = 30  
 From (I), Alam = 40 and Jugraj = 10  
 By similar deductions, we get the above arrangement.  
 Let us verify each choice:  
 (1) This cannot be true as Alam ended with Rs.5, not Rs.9.50.  
 (2) This cannot be true. If Sandeep ended with Re.1.00 then he must have spent Rs.29, which cannot be Rs.1.50 more than 20, the amount that Daljeet started with.  
 (3) Ganesh ended with Rs.16.50 not with Rs.4.00.  
 (4) This can be true as 7 is greater than 5, the amount Alam ended up with as per condition (vi).  
 Choice (4)

3. The given information can be represented with the help of the following Venn Diagram.



$$\text{Dr. Paul} = 50 + 30 + 40 + 0 = 150$$

$$\text{Dr. Gerard} = 50$$

$$\text{Dr. Hormis} = 40$$

Hence, Paul > Gerard > Hormis is possible.

Choice (1)

4. As per the given information, we can have the following conclusions.

- (i) One among the those is Bipin.
- (ii) Loyala  $\neq$  1st ( $\Rightarrow$  2<sup>nd</sup> / 3<sup>rd</sup>)
- (iii) Little Flower = Riaz
- (iv) Convent  $\neq$  Hyd
- (v) Pune = 3<sup>rd</sup>
- (vi) Pune  $\neq$  Loyola
- (vii) B'lore  $\neq$  1st (2<sup>nd</sup> / 3<sup>rd</sup>)
- (viii) Balbir  $\neq$  Convent

$$(\Rightarrow \text{Babir} = \text{Loyola})$$

From (v) and (vii), B'lore = 2<sup>nd</sup>, hence Hyderabad = 1st. From similar deductions we get the following final arrangement:

Prize	Name	School	City
3rd	Bipin	Convent	Pune
1st	Riaz	Little Flower	Hyderabad
2nd	Balbir	Loyola	B'lore

Choice (3) is true.

Choice (3)

5. Let the age of the elder boy = x yrs, and younger boy = y yrs.

$$(i) y = \sqrt[3]{xy} \text{ and } x, y < 10 \text{ yrs.}$$

Hence,  $x = y^2$ , which means that either  $x = 4$  and  $y = 2$  or  $x = 9$  and  $y = 3$

Assume  $x = 4$ ,

If  $x = 4$  and  $y = 2$ , then  $F = 24$  and  $M = 42/2 = 21$

Also,  $24 - 21 = 3$

Hence, the age of the younger boy is 2 years.

Choice (3)

6. Total seating capacity of the waiting hall = 200.  
No. of vacant seats = 10% of 200 = 20  
 $\therefore$  No. of filled seats =  $200 - 20 = 180$   
No. of ladies = 40% of 180 = 72  
Seating capacity of each flight =  $2/3 \times 180 = 120$   
After boarding flight A, empty waiting hall seats  
= 60% of 200 = 120  
No. of passengers waiting for flight B =  $200 - 120 = 80$   
Hence, No. of passengers who boarded flight A  
=  $180 - 80 = 100$ .  
No. of women in that =  $100/2 = 50$   
For 20 waiting, 1 Air Hostess  
For 80 waiting  
 $\Rightarrow$  4 Air Hostess  
No. of empty seats in B =  $120 - 80 = 40$   
Empty seats in flight B : Air hostesses in A  
=  $40 : 4 = 10 : 1$       Choice (1)

**Directions for questions 7 to 10:** Answer these questions based on the information given below.

A country has the following types of traffic signals.

- 3 red lights = stop;
- 2 red lights = turn left;
- 1 red light = turn right;
- 3 green lights = go at 100 kmph speed;
- 2 green lights = go at 40 kmph speed;
- 1 green light = go at 20 kmph speed.

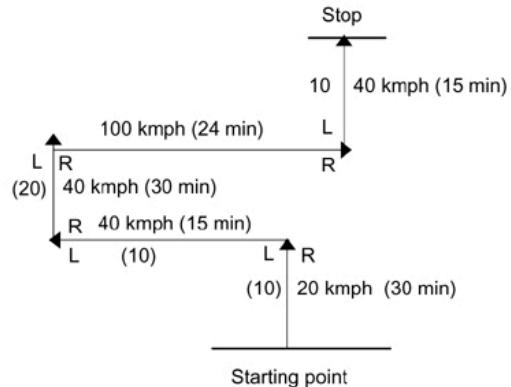
A motorist starts at a point on a road and follows all traffic signals literally. His car is heading towards the north. He encounters the following signals (the time mentioned in each case below is applicable after crossing the previous signal).

- Starting Point – 1 green light;
- after half an hour, 1<sup>st</sup> signal – 2 red & 2 green lights;
- after 15 minutes, 2<sup>nd</sup> signal – 1 red light;
- after half an hour, 3<sup>rd</sup> signal – 1 red & 3 green lights;
- after 24 minutes, 4<sup>th</sup> signal – 2 red & 2 green lights;
- after 15 minutes, 5<sup>th</sup> signal – 3 red lights;



### Solutions for 7 to 10:

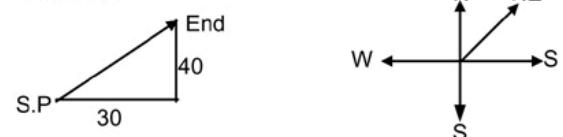
As per the given instructions, we get the following diagram:



Distance travelled at the speed of 100 kmph in 24 min =  $100/60 \times 24 = 40$  kms  
Similarly, the other distances are calculated.

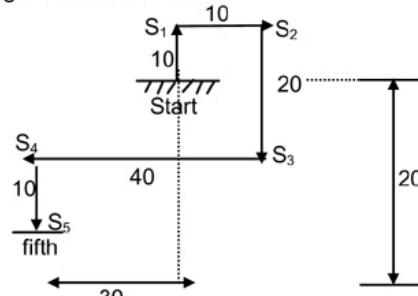
7. Total distance travelled  
 $= 10 + 10 + 20 + 40 + 10 = 90$  kms      Choice (1)

8. Vertical distance from starting point  
 $= 10 + 20 + 10 = 40$  kms  
Horizontal distance from starting point  $= 40 - 10$   
 $= 30$  kms.      N    NE



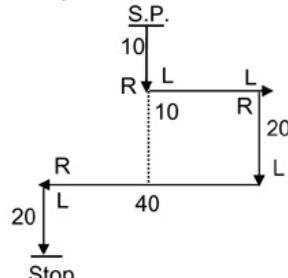
Hence, the motorist is 50 km away and to the North-East of the starting point. Choice (3)

9. If the motorist had turned right instead of left then, the distances would not have changed but the diagram would look like:



∴ He would have been 30 km to the west and 20 km to the south of the starting point.      Choice (1)

10. If instead of starting towards the north, had the car started towards the south, then the given figure gets rotated by  $180^\circ$ , to look like below:



Hence, the final position of the motorist is 30 km to the West and 40 km to the South. Choice (3)

**Directions for questions 11 to 13:** Answer these questions based on the table given below.

The following table provides the data on the different countries and locations of their capitals. (the date may not match the actual Latitude, Longitudes of these countries.) Answer the following questions on the basis of this table.

SI. No.	Country	Capital	Latitude	Longitude
1	Argentina	Buenes Aires	34.30 S	58.20 E
2	Australia	Canberra	35.15 S	149.08 E
3	Austria	Vienna	48.12 N	16.22 E
4	Bulgaria	Sofia	42.45 N	23.20 E
5	Brazil	Brasilia	15.47 S	47.55 E
6	Canada	Ottawa	45.27 N	75.42 E
7	Cambodia	Phnom Penh	11.33 N	104.55 E
8	Ecuador	Quito	0.15 S	78.35 E
9	Ghana	Accra	5.35 N	0.6 E
10	Iran	Teheran	35.44 N	51.30 E
11	Ireland	Dublin	53.20 N	6.18 E
12	Libya	Tripoli	32.49 N	13.07 E
13	Malaysia	Kuala Lumpur	3.9 N	101.41 E
14	Peru	Lima	12.05 S	77.0 E
15	Poland	Warsaw	52.13 N	21.0 E
16	New Zealand	Wellington	41.17 S	174.47 E
17	Saudi Arabia	Riyadh	24.41 N	46.42 E
18	Spain	Madrid	40.25 N	3.45 W
19	Sri Lanka	Colombo	6.56 N	79.58 E
20	Zambia	Lusaka	15.28 S	28.16 E

- 11.** What percentage of cities located within  $10^{\circ}$  E and  $40^{\circ}$  E ( $10$ -degree East and  $40$  degree East) lie in the Southern Hemisphere?  
 (1) 15%    (2) 20%    (3) 25%    (4) 30%

**Solution:**

There are 5 cities located within  $10^{\circ}$ E and  $40^{\circ}$ E, out of which only one city (Lusaka) is lying in the Southern Hemisphere.

$$\therefore \text{Required percentage} = 1/5 \times 100 = 20\% \quad \text{Choice (2)}$$

- 12.** The number of cities whose names begin with a consonant and are in the Northern Hemisphere in the table  
 (1) exceeds the number of cities whose names begin with a consonant and are in the southern hemisphere by 1.  
 (2) exceeds the number of cities whose names begin with a consonant and are in the southern hemisphere by 2.  
 (3) is less than the number of cities whose names begin with a consonant and are in the east of the meridian by 1.  
 (4) is less than the number of countries whose name begins with a consonant and are in the east of the meridian by 3.

**Solution:**

Considering the variables given in the question we have the following:

- (1) Number of cities whose names begin with a consonant and are in Northern Hemisphere = 11.  
 (2) Number of cities whose names begin with a consonant and are in Southern Hemisphere = 7.  
 (3) Number of cities whose names begin with a consonant and are in the East = 17.  
 (4) Number of countries whose names begin with a consonant and are in the East = 13.  
 Hence, none of the answer choices given are correct.

- 13.** The ratio of the number of countries whose name starts with vowels and located in the southern hemisphere, to the number of countries, the name of whose capital cities starts with a vowel in the table above is:  
 (1) 3 : 2    (2) 3 : 3    (3) 3 : 1    (4) 4 : 3

**Solution:**

Number of countries whose names start with vowels and are in the Southern Hemisphere = 3

Number of countries whose names of their capital cities start with a vowel = 2.

$$\therefore \text{Required ratio} = 3 : 2$$

Choice (1)

**Directions for questions 14 to 21:** Each item is followed by two statements, A and B. Answer each question using the following instructions.

Choose 1 if the question can be answered by one of the statements alone but not by the other.

- Choose 2 if the question can be answered by using either statement alone.
- Choose 3 if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
- Choose 4 if the question cannot be answered by either of the statements.

- 14.** In a hockey match, the Indian team was behind by 2 goals with 5 min remaining. Did they win the match?
- Deepak Thakur, the Indian striker, scored 3 goals in the last five minutes of the match.
  - Korea scored a total of 3 goals in the match.
- (1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

From statement A, we know only the number of goals made by India in last 5 minutes and as we don't know what the opponent team did in the last 5 minutes.

∴ Statement A alone is not sufficient. From statement B, we know the number of goals made by Korea and as we don't know the total number of goals scored by India. Statement B alone is not sufficient. Using both the statements, we have two possibilities.

- If Korea had scored 3 goals 5 minutes before the end of the match, India would have scored 1 goal. In the last 5 minutes as India made 3 goals and Korea on the whole made 3 goals, we can conclude that India had won the game.
- If Korea had scored 2 goals 5 minutes before the end of the match, India would have scored zero goals. In the last 5 matches as India made 3 goals and Korea on the whole 3 goals, we can say that match was drawn in this case. As no unique answer, hence mark (4).

- 15.** Four students were added to a dance class. Would the teacher be able to divide her students evenly into a dance team (or teams) of 8?
- If 12 students were added, the teacher could put everyone in teams of 8 without any leftovers.
  - The number of students in the class is currently not divisible by 8.
- (1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

Let the number of students initially be  $x$ .

From statement A, we have  $\Rightarrow (x + 12) \div 8$

This is possible only when  $x = 4, 12, 20, \dots$ , i.e., odd multiples of 4.

$$\Rightarrow \text{Now}, \frac{x+12}{8} = \left(\frac{x+4}{8}\right) + \left(\frac{8}{8}\right)$$

∴  $(x + 4)$  is also divided by 8, since 8 is divided by 8.

From statement A, we can say that the total number of students in the class can be divided into teams of 8. From statement B, as we don't know anything about the number of students currently, except that it is not divisible by 8, we can't find whether can be divided into teams of 8 or not after adding 4 more students.

Choice (1)

- 16.** Is  $x = y$ ?

- $(x+y)\left(\frac{1}{x} + \frac{1}{y}\right) = 4$
  - $(x-50)^2 = (y-50)^2$
- (1) 1      (2) 4      (3) 3      (4) 2

**Solution:**

From statement A, we have  $(x+y)(1/x + 1/y) = 4$   
 $\Rightarrow (x+y)(y+x) = 4xy \Rightarrow (x+y)^2 = 4xy$

$$\Rightarrow (x-y)^2 = 0 \Rightarrow x = y$$

∴ Statement I alone is sufficient.

From statement B, we have  $(x-50)^2 = (y-50)^2$

$$\Rightarrow x - 50 = \pm (y - 50)$$

$$\Rightarrow x - 50 = y - 50 \text{ (or)} x - 50 = -y + 50$$

$$\Rightarrow x = y \text{ (or)} x + y = 100$$

From statement B as we have two possibilities, it alone is not sufficient.

Choice (1)

- 17.** A dress was initially listed at a price that would have given the store a profit of 20% of the wholesale cost. What was the wholesale cost of the dress?

- After reducing the listed price by 10%, the dress sold for a net profit of 10 dollars.
  - The dress sold for 50 dollars.
- (1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

Let the cost price of the dress be  $x$  dollars. Therefore listed price =  $1.2x$  dollars. From statement A, we have 90% of  $1.2x = x + 10$ .

$$\Rightarrow 1.078x = x + 10$$

⇒ The value of  $x$  can be found from statement B, we don't know whether the dress is sold at the list price or at any other price after discount, this alone is not sufficient.

Choice (1)

- 18.** Is 500 the average (arithmetic mean) score on the GMAT?

- Half of the people who take the GMAT score above 500 and half of the people score below 500.
  - The highest GMAT score is 800 and the lowest score is 200.
- (1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

From statement A, as we don't know the deviations of the scores from 500, we can't say that 500 is the average.

From statement B, we know the highest and the lowest score. We know that average lies between the highest and lowest, we can say that average lies between 200 and 800, but we can't find exact value. Using both the statements also we can't find the average, as the information given in statements A and B can't be correlated.

Choice (4)

- 19.** Is  $|x-2| < 1$ ?

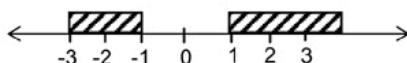
- $|x| > 1$
  - $|x-1| < 2$
- (1) 2      (2) 1      (3) 3      (4) 4

**Solution:**

Statements are given below, which are not given in the cat bulletin.

From statement A alone  $|x| > 1$

$\Rightarrow x \in (-\infty, -1) \cup (1, \infty)$  i.e.,



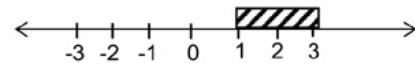
we have to find if  $|x - 2| < 1$ , i.e if x is less than 1 unit away from 2. Clearly, we cannot be sure of that given the range of x we got from statement A alone.

From statement B alone  $|x - 1| < 2$

$\Rightarrow x$  is less than 2 units away from 1.

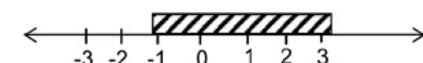
$\Rightarrow x \in (-1, 3)$

$\Rightarrow$



Using this range alone also we cannot be sure whether x is less than 1 unit away from 2. Using both A and B we get the following range (overlap of both ranges)  $x \in (1, 3)$

$\Rightarrow$



which clearly show that x is not more than 1 unit away from 2. i.e  $|x - 2| < 1$  Choice (4)

20. People in a Club either speak French or Russian or both. Find the number of people in a club who speak only French.

- A. There are 300 people in the club and the number of people who speak both French and Russian is 196.
- B. The number of people who speak only Russian is 58.

(1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

Statement A gives only the total number of persons and the number of persons speaking both French and Russian but to know the number of persons speaking only French, we should know the number of persons speaking only Russian. As this is not given, statement A alone is not sufficient.

Statement B does not mention the number of persons in the club and the numbers of persons speaking both the languages, this alone is not sufficient. Using both the statements, as we know the total number of persons, persons speaking both the languages and speaking only Russian, we can find the number of persons speaking only French, using only French = Total + Persons speaking both language – persons speaking only Russian.

Choice (3)

21. A sum of Rs.38,500 was divided among Jagdish, Punit and Girish. Who received the minimum amount?
- Jagdish received  $2/9$  of what Punit and Girish together received.
  - Punit received  $3/11$  of what Jagdish and Girish together received.

(1) 1      (2) 2      (3) 3      (4) 4

**Solution:**

Neither of the statements is independently sufficient as we don't know the amounts with Girish and the relationship of amount of Girish with Jagdish or Punit.

Using both the statements, we have,

$$J = 2/9 (P + G) \dots\dots\dots(1) \text{ and}$$

$$P = 3/11 (J + G) \dots\dots\dots(2)$$

Where J, P and G are the respective amounts with Jagdish, Punit and Girish.

$$P = \frac{3}{11} \left[ \frac{2}{9} (P + G) + G \right] \Rightarrow \frac{P}{G} = \frac{11}{31} \Rightarrow P = 11k \text{ and}$$

$G = 31k$ . Substituting this ratio in (1) or (2), we can find J in terms of K.

$\therefore$  As we found G, P and J, we can find who got the minimum amount.

Choice (3)

**Directions for questions 22 to 25:** Answer these questions based on the table given below.

The following table gives details regarding the total earnings of 15 employees and the number of days they have worked on complex, medium and simple operation in the month of June 2002. Even though the employees might have worked on an operation, they would be eligible for earnings only if they have minimum level of efficiency.

Emp.No.	Total Earnings				Total Days			
	Complex	Medium	Simple	Total	Complex	Medium	Simple	Total
2001147	82.98		636.53	719.51	3.00	0.00	23.00	26.00
2001148	51.53		461.73	513.26	3.33	1.67	16.00	21.00
2001149	171.71		79.10	250.81	5.50	4.00	8.50	18.00
2001150	100.47		497.47	597.95	6.00	4.67	7.33	18.00
2001151	594.43	159.64		754.06	9.67	13.33	0.00	23.00
2001156	89.70			89.70	8.00	0.00	1.00	9.00
2001158	472.31	109.73		582.04	1.39	9.61	0.00	11.00
2001164	402.25	735.22	213.67	1351.14	5.27	12.07	0.67	18.00
2001170	576.57			576.57	21.00	0.00	0.00	21.00
2001171	286.48	6.10		292.57	8.38	4.25	0.38	13.00
2001172	512.10	117.46		629.56	10.00	8.50	3.50	22.00
2001173	1303.88			1303.88	25.50	0.00	0.50	26.00
2001174	1017.94			1017.94	26.00	0.00	0.00	26.00
2001179	46.56	776.19		822.75	2.00	19.00	0.00	21.00
2001180	116.40	1262.79		1379.19	5.00	19.00	0.00	24.00

22. The number of employees who have earned more than 50 rupees per day in complex operations is:  
 (1) 4      (2) 3      (3) 5      (4) 6

**Solution:**

A simple inspection of the complex earnings column and the Total Days (complex) would give the desired result. Employees 2001151, 2001158, 2001164, 2001172 and 2001173 have earned more than 50 rupees per day in complex operations. Choice (3)

23. The number of employees who have earned more than 600 rupees and having more than 80% attendance (there are 25 regular working days in June 2002; some might be coming on overtime too) is:  
 (1) 4      (2) 5      (3) 6      (4) 7

**Solution:**

All that we have to check here is the total earnings column (for earnings greater than 600/-) and also the total attendance column (for attendance greater than 20 days i.e., 80% of 25 days).

Employees 2001147, 2001151, 2001172, 2001173, 2001174, 2001179 and 2001180, satisfy the given criteria.

Choice (4)

24. The employee number of the person who has earned the maximum earnings per day in medium operation is:

(1) 2001180      (2) 2001164  
 (3) 2001172      (4) 2001179

**Solution:**

The best approach for this question is to work out each of the choices given, as there is no 'none of these' option.

Emp. No.	Earnings medium	Total days medium	Average per day
2001180	1262.79	19	66.46
2001164	735.22	12.07	60.91
2001172	117.46	8.50	13.891
2001179	776.19	19	40.85

∴ Emp. 2001180 earned the maximum per day.  
 Choice (1)

25. Among the employees who were engaged in complex and medium operations, the number of employees whose average earning per day in complex operations is more than average earning per day in medium operations is  
 (1) 2      (2) 3      (3) 5      (4) 7

**Solution:**

By inspection we find that only employees 2001151, 2001158, 2001164, 2001171, 2001172, 2001179 and 2001180 were involved in complex and medium operations. Of these only the employees 2001151, 2001158, 2001164, 2001171, 2001172 had an average earning per day in complex operations more than that in medium operations. Choice (3)

**Directions for questions 26 to 33:** Answer these questions based on the table given below.

The following table shows the revenue and expenses in millions of Euros (European currency) associated with REPSOL YPF company's oil and gas producing activities in operations in different parts of the world for the years 1998-2000.

**REPSOL YPF'S Operations of Oil and Gas Producing Activities.**

S.No.	Item	Year	Total World	Spain	North Africa & Middle East	Argentina	Rest of Latin America	Far East	North Sea	Rest of the World
1	Revenue	1998	916	70	366	281	34	82	78	5
		1999	3374	55	666	2006	115	301	140	91
		2000	8328	394	1290	5539	482	603	0	20
2	Expenses	1998	668	39	255	187	57	63	52	15
		1999	1999	48	325	1168	131	204	65	58
		2000	3709	43	530	2540	252	311	0	33
3	Income before Taxes & Charges Revenue- Expenses = [(1) - (2)]	1998	248	31	111	94	-23	19	26	-10
		1999	1375	7	341	838	-16	97	75	33
		2000	4619	351	760	2999	230	292	0	-13
4	Taxes & Charges	1998	152	6	104	33	-3	9	6	-3
		1999	561	3	169	338	-6	39	21	-3
		2000	1845	126	404	1150	61	103	0	1
5	Net Income after Taxes & Charges [= (3) - (4)]	1998	96	25	7	61	-20	10	20	-7
		1999	814	4	172	500	-10	58	54	36
		2000	2774	225	356	1849	169	189	0	-14

Based on the table above, answer the following questions:

26. How many operations (Spain, North Africa and Middle East,..) of the company accounted for less than 5% of the total revenue earned in the year 1999?  
 (1) 2      (2) 3      (3) 4      (4) None of these

**Solution:**

Total Revenue in 1999 = 3374 Mn Euros ∴ 5% of 3374 = 168.74 Mn Euros

The operations in Spain, rest of Latin America, North Sea and the rest of the world generated less than 5% of revenue a total of four regions.

Choice (3)



**Directions for questions 34 and 35:** Answer these questions based on the pie charts given below:

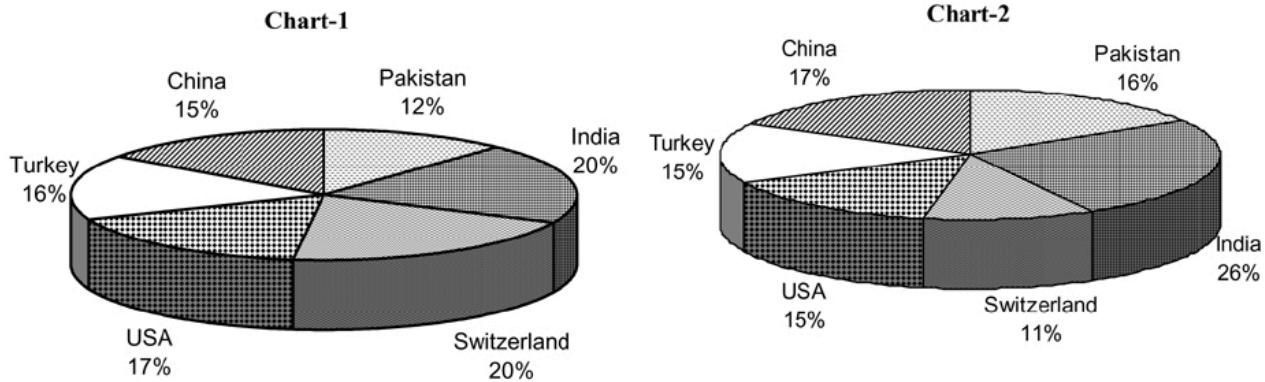


Chart 1 shows the distribution by value of top 6 suppliers of MFA Textiles in 1995. Chart 2 shows the distribution by quantity of top 6 suppliers of MFA Textiles in 1995. The total value is 5760 million Euro (European currency). The total quantity is 1.055 million tonnes.



**Solution:**

The relevant ratio is  $\frac{\% \text{ share by value}}{\% \text{ share by volume}}$ , which by observation is clearly the highest in case of Switzerland.

35. The average price in Euro/Kg for Turkey is roughly  
(1) 6.20    (2) 5.60    (3) 4.20    (4) 4.80

**Solution:**

From the above graph we know that the average price in Euro / Kg of Turkey is approximately 5.82.  
Choice (2)

**Directions for questions 36 to 41:** Answer these questions based on the tables given below.

There are 6 refineries, 7 depots and 9 districts. The refineries are BB, BC, BD, BE, BF and BG. The depots are AA, AB, AC, AD, AE, AF and AG. The districts are AAA, AAB, AAC, AAD, AAE, AAF, AAG, AAH and AAI. Table A gives the cost of transporting one unit from refinery to depot. Table B gives the cost of transporting one unit from depot to a district.

**Table A**

	<b>BB</b>	<b>BC</b>	<b>BD</b>	<b>BE</b>	<b>BF</b>	<b>BG</b>
AA	928.2	537.2	567.8	589.9	589.9	800.1
AB	311.1	596.7	885.7	759.9	759.9	793.9
AC	451.1	0	320.1	780.1	720.7	1000.1
AD	371.1	150.1	350.1	750.1	650.4	980.1
AE	1137.3	314.5	0	1157.7	1157.7	1023.4
AF	617.1	516.8	756.5	1065.9	1065.9	406.3
AG	644.3	299.2	537.2	1093.1	1093.1	623.9

**Table B**

	<b>AA</b>	<b>AB</b>	<b>AC</b>	<b>AD</b>	<b>AE</b>	<b>AF</b>	<b>AG</b>
AAA	562.7	843.2	314.5	889.1	0	754.8	537.2
AAB	532.7	803.2	284.5	790.5	95.2	659.6	442
AAC	500.7	780.2	0	457.3	205.7	549.1	331.5
AAD	232.9	362.1	286.2	275.4	523.6	525.3	673.2
AAE	345.1	268.6	316.2	163.2	555.9	413.1	227.8
AAF	450.1	644.3	346.2	372.3	933.3	402.9	379.1
AAG	654.5	0	596.7	222.7	885.7	387.6	348.5
AAH	804.1	149.6	627.2	360.4	1035.3	537.2	498.1
AAI	646	255	433.5	137.7	698.7	112.2	161.5

36. What is the least cost of sending one unit from any refinery to any district?  
 (1) 95.2 (2) 0 (3) 205.7 (4) 284.5

**Solution:**

The question asks us to find the minimum cost of transporting one unit from any refinery to any district. For example: by considering the refinery BC we know that its cost is 0, for depot AC. From AC depot it costs 0 to send one unit to district AAC.

∴ Minimum cost is 0. Choice (2)

37. What is the least cost of sending one unit from any refinery to the district AAB?  
 (1) 0 (2) 284.5  
 (3) 95.2 (4) None of these

**Solution:**

The least cost for AAB is from depot AE i.e., 95.2. The least cost of depot AE is from refinery BD which is 0. ∴ Minimum cost from any refinery to district AAB is when the unit is sent from AE to BE to AAB and the cost is 95.2. Choice (3)

38. What is the least cost of sending one unit from refinery BB to any district?  
 (1) 284.5 (2) 311.1  
 (3) 451.1 (4) None of these

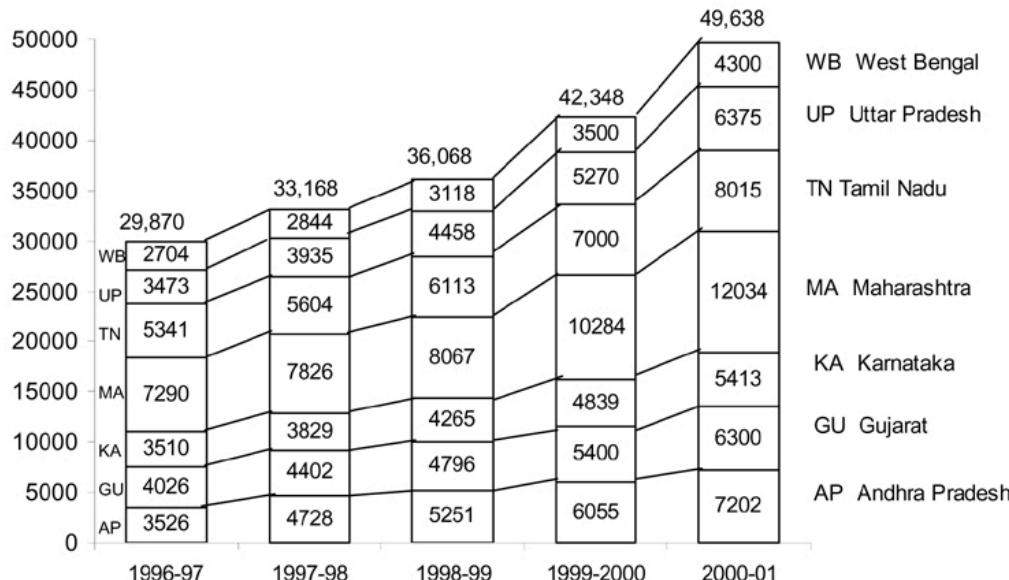
**Solution:**

BB to depot AB has the least cost of 311.1. AB to district AAG costs 0. Hence, the least cost from BB to any district is 311.1. Choice (2)

39. What is the least cost of sending petrol from refinery BB to district AAA?  
 (1) 765.6 (2) 1137.3  
 (3) 1154.3 (4) None of these

**Directions for questions 42 to 47:** Answer these questions based on the chart given below.

The chart given below indicates the annual sales tax revenue collections (in crores of rupees) of seven states from 1997 to 2001. The values given at the top of each bar represents the total collections in that year.



**Solution:**

The least costs for BB to the depots is in the case of AB (311.1), AD (371.1), AC (451.1).

From AB to AAA it costs 562.7

∴ Cost from BB to AAA through AB is = 311.1 + 562.7 = 873.8

From BB to AAA through AD it costs = 371.1 + 889.1 = 1260.2

From BB to AAA through AC it costs = 451.1 + 314.5 = 765.6

765.6 is thus the lowest cost Choice (1)

40. How many possible ways are there for sending petrol from any refinery to any district?

- (1) 63 (2) 42  
 (3) 54 (4) 378

**Solution:**

Totally there are 6 refineries, 7 depots and 9 districts.

∴ The total number of ways of sending one unit from any refinery to any district =  $6 \times 7 \times 9 = 378$ .

Choice (4)

41. The largest cost of sending petrol from any refinery to any district is

- (1) 2172.6 (2) 2193.0  
 (3) 2091.0 (4) None of these

**Solution:**

By observation we know that in table A the highest cost mentioned is from BE to AE and from BF to AE which is 1157.7. The highest such cost is table B is for AE to AAH which is 1035.3

∴ The highest cost would be 1157.7 + 1035.3 = 2193

Choice (2)

42. If for each year, the states are ranked in terms of the descending order of sales tax collections, how many states don't change the ranking more than once over the five years?

(1) 1      (2) 5      (3) 3      (4) 4

**Solution:**

Rank	1996-97	97-98	98-99	99-2000	2000-01
1	MA	MA	MA	MA	MA
2	TN	TN	TN	TN	TN
3	GU	AP	AP	AP	AP
4	AP	GU	GU	GU	UP
5	KA	UP	UP	UP	GU
6	UP	KA	KA	KA	KA
7	WB	WB	WB	WB	WB

Five states – MA, TN, AP, KA and WB have not changed their ranking more than once.

Choice (2)

43. Which of the following states has changed its relative ranking most number of times when you rank the states in terms of the descending volume of sales tax collections each year?

(1) Andhra Pradesh      (2) Uttar Pradesh  
 (3) Karnataka      (4) Tamil Nadu

**Solution:**

From the above graph, AP has changed its ranking only once. UP has changed twice, KA has changed once and TN has not changed at all.

∴ UP has changed the maximum number of times.  
 Choice (2)

44. The percentage share of sales tax revenue of which state has increased from 1997 to 2001?

(1) Tamil Nadu      (2) Karnataka  
 (3) Gujarat      (4) Andhra Pradesh

**Solution:**

State	$\frac{\text{Sales tax}}{\text{Total sales tax}}$	$\frac{\text{Sales tax}}{\text{Total sales tax}}$
Tamil Nadu	1/6	1/6
Karnataka	1/8	1/10
Gujarat	1/7.5	1/8
Andhra Pradesh	1/8	1/7

Only Andhra Pradesh has increased from 1997 to 2001.  
 Choice (4)

45. Which pair of successive years shows the maximum growth rate of tax revenue in Maharashtra?

(1) 1997 to 1998  
 (2) 1998 to 1999  
 (3) 1999 to 2000  
 (4) 2000 to 2001

**Solution:**

Consider only the ratio of  $\frac{\text{Tax in any year}}{\text{Tax in previous year}}$

$\frac{10284}{8067}$  is the highest ratio i.e in the years 1999-2000.  
 Choice (3)

Note: Here, where the format of the years in choices is different from that in the tall/data, the end of the year is considered. i.e. 1998-99 to 1999-2000 is read as 99 to 2000.

46. Identify the state whose tax revenue increased exactly by the same amount in two successive pair of years?

(1) Karnataka      (2) West Bengal  
 (3) Uttar Pradesh      (4) Tamil Nadu

**Solution:**

By observing we know that it happens in the case of Karnataka, for the pairs of year 1998-99 and 1999-2000 and for 1999-2000 and 2000-01. It is advisable to check for differences in the last digits first, so as to eliminate choices.      Choice (1)

47. Which state below has been maintaining a constant rank over the years in terms of its contribution to total tax collections?

(1) Andhra Pradesh  
 (2) Karnataka  
 (3) Tamil Nadu  
 (4) Uttar Pradesh

**Solution:**

This can be answered from the table prepared for Q.42. The states of Maharashtra, Tamil Nadu and West Bengal have maintained a constant rank in terms of their contribution. Of these, only Tamil Nadu is given in the choices and it is our answer.      Choice (3)

**Directions for questions 48 to 50:** Answer these questions based on the table given below.

The table below gives information about four different crops, their different quality categories and the regions where they are cultivated. Based on the information given in the table answer the questions below:

Type of Crop	Quality	Region
Crop – 1	High	R1, R2, R3, R4, R5
	Medium	R6, R7, R8
	Low	R9, R10, R11
Crop – 2	High	R5, R8, R12
	Medium	R9, R13
	Low	R6
Crop – 3	High	R2, R6, R7, R13
	Medium	R3, R9, R11
	Low	R1, R4
Crop – 4	High	R3, R10, R11
	Medium	R1, R2, R4
	Low	R5, R9

48. How many regions produce medium qualities of Crop-1 or Crop-2 and also produce low quality of Crop-3 or Crop-4?  
 (1) Zero (2) One (3) Two (4) Three

**Solution:**

Regions producing medium quality crop-1 or crop-2 = R6, R7, R8, R9, R13 → (1)  
 Regions producing low quality crop-3 or crop-4 = R1, R4, R5, R9 → (2)  
 ∴ Regions common in (1) and (2) is only R9 (only one region)

Choice (2)

49. Which of the following statements is true?  
 (1) All medium quality Crop-2 producing regions are also high quality Crop-3 producing regions.  
 (2) All High quality Crop-1 producing regions are also medium and low Crop-4 producing regions.  
 (3) There are exactly four Crop-3 producing regions, which also produce Crop-4 but not Crop-2.  
 (4) Some Crop-3 producing regions produce Crop-1, but not high quality Crop-2.

**Solution:**

Statement (1): R9 produces medium quality crop - 2 but not high quality crop - 3. ∴ (1) is false.  
 Statement (2): R1 produces high quality crop - 2 but not low quality crop - 4. (2) is false.  
 Statement (3): Crop - 3 producing regions are R1, R2, R3, R4, R6, R7, R9, R11 and R13. Regions producing crop - 4 but not crop 2 are R1, R2, R3, R4, R10 and R11. The common regions are R1, R2, R3, R4 and R11 i.e., a total of five regions. (3) is also false.  
 Choice (4)

50. How many low quality Crop-1 producing regions are either high quality Crop-4 producing regions or medium quality Crop-3 producing regions?  
 (1) One (2) Two (3) Three (4) Zero

**Solution:**

Low quality Crop-1 regions = R9, R10, R11 → (1)  
 High Quality Crop-4 regions = R3, R10, R11 → (2)  
 Medium Quality Crop-3 regions = R3, R9, R11 → (3)  
 All the regions in (1) are also present in (2) and (3). Hence, three regions is our answer.

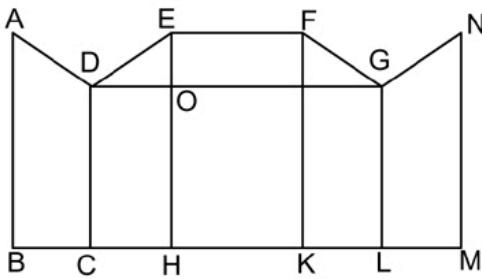
Choice (3)

## SECTION – II (Quant)

Number of Questions: 50

**Directions for questions 51 and 52:** Answer these questions based on the following diagram.

$\angle ABC = 90^\circ = \angle DCH = \angle DOE = \angle EHK = \angle FKL = \angle GLM = \angle LMN$ ,  $AB = BC = 2CH = 2CD = EH = FK = 2HK = 4KL = 2LM = MN$ .



51. The magnitude of  $\angle FGO$  =  
 (1)  $30^\circ$  (2)  $45^\circ$   
 (3)  $60^\circ$  (4) None of these

**Solution:**

Let the point of intersection of FK and G + D be named P.

From the given data about right angles,

$\angle FPG = 90^\circ$ ,  $D \Delta FPG$  is right angled triangle. → (1)

From the data about the measurements of the segments, if AB is represented by  $2x$ , then,  $KF = 2x \rightarrow (2)$  and since  $\angle DOE = 90^\circ$ , we have  $DG \parallel CH$  and  $PK = DC = x$  and  $KL = x/2$ .

∴ Tan of  $\angle FGO = x/(x/2) = 2$ , which is not equal to  $\tan 30^\circ$ , or  $60^\circ$  or  $45^\circ$ .  
 Choice (4)

52. The ratio of the areas of the two quadrangles ABCD and DEFG is  
 (1)  $1 : 2$  (2)  $2 : 1$   
 (3)  $12 : 7$  (4) None of these

**Solution:**

Quadrangle ABCD is a trapezium, with parallel sides  $2x$  and  $x$ . The perpendicular distance between them is BC, which is  $2x$ .

Hence, the area of ABCD =  $\frac{1}{2}(2x)(2x+x) = 3x^2 \dots (1)$

Quadrangle DEFG is also a trapezium, with the parallel sides measuring,  $DG = x + x + x/2, 5x/2$  and  $EF = x$ . The perpendicular distance between them FP (which is  $x$ ). However, area of DEFG =  $\frac{1}{2}(x)(5x/2 + x) = 7x^2/4 \rightarrow (2)$

From (1) and (2),

The ratio of areas of quadrangles, ABCD and DEFG is  $3x^2 : 7x^2/4 = 12 : 7$ .  
 Choice (3)

**Directions for questions 53 to 87:** Answer the questions independent of each other...

53. It takes 6 technicians a total of 10 hours to build a new server from Direct Computer, which each working at the same rate. If 6 technicians start to build the server at 11 AM, and one technician per hour is added beginning at 5 PM, at what time will the server be complete?

- (1) 6 : 40 PM (2) 7 PM  
 (3) 7 : 20 PM (4) 8 PM

**Solution:**

6 technicians work from 11AM to 5PM, i.e., for 6 hours;  
 $\Rightarrow$  work completed =  $6 \times 6 = 36$  man-hours. → (1)

Total work to be done =  $6 \times 10 = 60$  man-hours;  
 because, 6 people take 10 hours to do the work → (2)

Hence, balance of work at 5PM =  $60 - 36$

= 24 man-hours → (3)

At 5PM, one technician joins the team, and hence, work completed from 5PM to 6PM is  $(6 + 1) = 7$  man hours → (4)



$$\Rightarrow BD^2/DC^2 = 16/9 \rightarrow (9) \text{ From (7), (8) and (9),}$$

$$\frac{(4-\sqrt{3}x)^2+x^2}{(3-\sqrt{3}x)^2+x^2} = \frac{16}{9} \Rightarrow 9[16+3x^2-8\sqrt{3}x+x^2]$$

$$= 16[9+3x^2-6\sqrt{3}x+\dots+x^2]$$

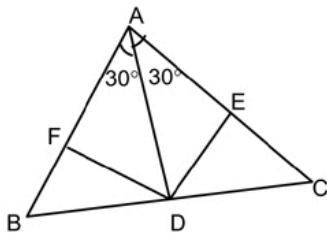
$$\Rightarrow 144 + 36x^2 - 72\sqrt{3}x = 144 + 64x^2 - 96\sqrt{3}x$$

$$= 28x^2 - 24\sqrt{3}x = 0 \Rightarrow 4x(7x - 6\sqrt{3}) = 0$$

$$\Rightarrow x = 0 \text{ or } \frac{6\sqrt{3}}{7} \rightarrow (10) \text{ } x = 0 \text{ is invalid}$$

From (4),  $AD = 2x = \frac{2 \times 6\sqrt{3}}{7} = \frac{12\sqrt{3}}{7}$

Alternately



$$\text{Area of triangle } ABC = \frac{1}{2} \times AB \times AC \times \sin A \\ = \frac{1}{2} \times 4 \times 3 \times \sin 60^\circ = 3\sqrt{3}$$

$$\text{Area of triangle } ACD = \frac{1}{2} \times AC \times AD \times \sin CAD \\ = \frac{3}{7} \times \text{Area of triangle } ABC$$

$$\Rightarrow \frac{1}{2} \times 3 \times AD \times \sin 30^\circ = \frac{3}{7} \times 3\sqrt{3}$$

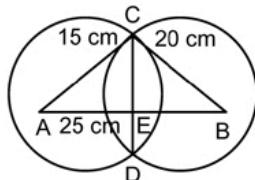
$$3/4 \times AD = 3/7 \times 3\sqrt{3}$$

$$AD = \frac{12\sqrt{3}}{7}$$

Choice (2)

58. The length of the common chord of two circles of radii 15 cm and 20 cm, whose centres are 25 cm apart, is (in cm):  
 (1) 24      (2) 25      (3) 15      (4) 20

**Solution:**



Distance between centres (25cm) is less than sum of the radii 'c' hence, circles intersect.  
 A, B are centres of the two circles: C, D are points of intersection of the two circles: E is point of intersection of AB and CD; CD is the common chord.  
 The measurements of the sides of  $\triangle ABC$  are 15, 20 and 25, i.e., ratio of 3 : 4 : 5. Hence, the angle opposite the longest side is  $90^\circ$ ; i.e.,  $\triangle ABC$  is right angled at C  $\rightarrow$  (1)

In the case of two intersecting circles, the line of centres perpendicularly bisects the common chord; i.e. AB is perpendicular to CD and  $CE = ED \rightarrow$  (2)  
 In the right angled  $\triangle ACB$ , (right angled at C), CE is the perpendicular to the hypotenuse.

Using area of  $\triangle ABC$ , we have  $\frac{1}{2} \times 15 \times 20 = \frac{1}{2} \times CE \times 25 \Rightarrow CE = 12 \text{ cm}$

Common chord CD = 2.CE =  $2 \times 12 = 24 \text{ cm}$ .

Choice (1)

59. If  $f(x) = \log \{(1+x)/(1-x)\}$ , then  $f(x) + f(y)$  is:

- (1)  $f(x+y)$
- (2)  $f\{(x+y)/(1+xy)\}$
- (3)  $(x+y)f\{1/(1+xy)\}$
- (4)  $f(x)+f(y)/(1+xy)$

**Solution:**

$$\text{Given } f(x) = \log \left\{ \frac{1+x}{1-x} \right\}$$

$$\Rightarrow f(y) = \log \left\{ \frac{1+y}{1-y} \right\}$$

$$\therefore f(x) + f(y) = \log \left( \frac{1+x}{1-x} \right) + \log \left( \frac{1+y}{1-y} \right)$$

$$= \log \left( \frac{(1+x)(1+y)}{(1-x)(1-y)} \right) = \log \left\{ \frac{1+(x+y)+xy}{1-(x+y)+xy} \right\}$$

From the answer choice, consider choice (2)

$$f\{(x+y)/(1+xy)\} = \log \left\{ \frac{1+\frac{x+y}{1+xy}}{1-\frac{x+y}{1+xy}} \right\}$$

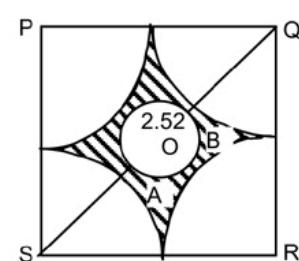
$$= \log \left\{ \frac{1+xy+x+y}{1+xy-(x+y)} \right\}$$

Choice (2)

60. Four horses are tethered at four corners of a square plot of side 14 metres (m) so that the adjacent horses can just reach one another. There is a small circular pond of area 20 m<sup>2</sup> at the centre. The area left ungrazed is:  
 (1) 22 m<sup>2</sup>    (2) 42 m<sup>2</sup>    (3) 84 m<sup>2</sup>    (4) 168 m<sup>2</sup>

**Solution:**

Data can be represented as in the diagram below:



Length of square = 14 m, and the horses are tethered at the corners such that the adjacent horses just reach one another.

$\Rightarrow$  length of the rope =  $14/2 = 7 \text{ m} \rightarrow$  (3)

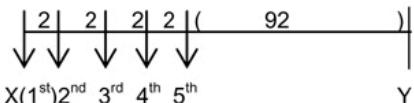
Ungrazed area =

$$= (\text{area of square}) - 4(\text{area of one of the sectors}) - (\text{area of circular pond}) \\ = (14)^2 - 4(90/360 \times 22/7 \times 7 \times 7) - (20) \\ = 196 - 154 - 20 = 22 \text{ m}^2$$

Choice (1)

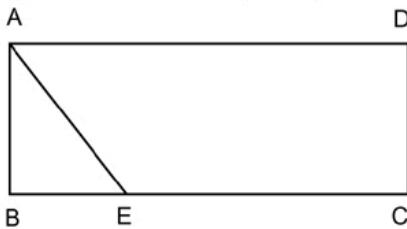
61. On a straight road XY, 100 metres long, five heavy stones are placed two metres apart beginning at the end X. A worker, starting at X, has to transport all the stones to Y, by carrying only one stone at a time. The minimum distance he has to travel (in metres) is:  
 (1) 472      (2) 422      (3) 744      (4) 860

**Solution:**



First the worker has to put all the stones from x to the fifth stone and all the stones from that place to y. The distance travelled by the worker = x to 2<sup>nd</sup> stone = 2 m  
 2<sup>nd</sup> stone to 3<sup>rd</sup> stone(2 stones) =  $2 + 1 \times 4 = 6$  m  
 3<sup>rd</sup> stone to 4<sup>th</sup> stone (3 stones) =  $2 + 2 \times 4 = 10$  m  
 4<sup>th</sup> stone to 5<sup>th</sup> stone (4 stones) =  $2 + 3 \times 4 = 14$  m  
 5<sup>th</sup> stone to y =  $9 \times 92 = 828$  m  
 $\therefore$  the least possible distance =  $828 + 14 + 10 + 6 + 2 = 860$  m  
 Choice (4)

62. In the figure given below, ABCD is a rectangle. The area of the isosceles right triangle ABE = 7 cm<sup>2</sup>. ; EC = 3(BE). The area of ABCD (in cm<sup>2</sup>) is:



- (1) 21      (2) 28      (3) 42      (4) 56

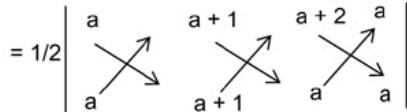
**Solution:**

Given EC = 3(BE).  $\therefore$  BC = 4(BE)  
 $\Rightarrow$  BE = BC/4  
 Area of triangle ABE =  $\frac{1}{2} \times AB \times BE = 7$  sq. cm  
 $\Rightarrow AB \times BC/4 = 14$  sq. cm.  
 $\Rightarrow AB \times BC = 56$  sq. cm, which is nothing but area of rectangle ABCD.  
 Choice (4)

63. The area of the triangle whose vertices are (a, a), (a + 1, a + 1), (a + 2, a) is:  
 (1)  $a^3$       (2) 1      (3) 2a      (4)  $2^{1/2}$

**Solution:**

Area of a triangle whose vertices are (a, a), (a + 1, a + 1), (a + 2, a) is



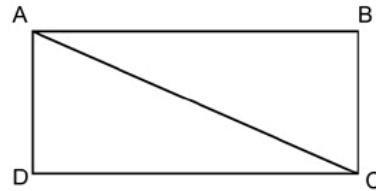
$$= \frac{1}{2} |[a(a+1) - a(a+1) + a(a+1) - (a+1)(a+2) + a(a+2) - a \cdot a]| \\ = \frac{1}{2} |[(a+1)(a-a-2) + 2a]| = \frac{1}{2} |-2| = 1 \text{ sq. units}$$

Choice (2)

64. Instead of walking along two adjacent sides of a rectangular field, a boy took a short cut along the diagonal and saved a distance equal to half the longer side. Then the ratio of the shorter side to the longer side is:

- (1) 1/2      (2) 2/3  
 (3) 1/4      (4) 3/4

**Solution:**



The boy reaches from A to C, walking along the diagonal AC.

Let length be l and breadth be b. The given data is AC = (l + b) - l/2

$$\Rightarrow \sqrt{l^2 + b^2} = \frac{l}{2} + b \rightarrow (1)$$

The ratio of b to l is to be determined; Let l/b = k  $\therefore$  b = lk  $\rightarrow$  (2)

from (1) and (2),

$$\Rightarrow \sqrt{l^2 + b^2 k^2} = \frac{l}{2} + lk \rightarrow (1) \Rightarrow \sqrt{1+k^2} = \frac{1}{2} + k \\ \Rightarrow 1 + k^2 = (1/2 + k)^2 \\ \Rightarrow 1 + k^2 = 1/4 + k^2 + k \\ \Rightarrow 1 - 1/4 = k; k = 3/4$$

Choice (4)

65. Only a single rail track exists between station A and B on a railway line. One hour after the north bound super fast train N leaves station A for Station B, a south bound passenger train S reaches station A from station B. The speed of the super fast train is twice that of a normal express train E, while the speed of a passenger train S is half that of E. On a particular day N leaves for station B from Station A, 20 minutes behind the normal schedule. In order to maintain the schedule both N and S increased their speed. If the super fast train doubles its speed, what should be the ratio (approximately) of the speed of passenger train to that of the super fast train so that passenger train S reaches exactly at the scheduled time at station A on that day.

- (1) 1 : 3      (2) 1 : 4  
 (3) 1 : 5      (4) 1 : 6

**Solution:**

Since there is only a single track, the second train leaves station B only after the first reaches B from A.  
 $\Rightarrow$  Sum of times taken by both trains = 1 hour  
 (since the second train reaches A one hour after the first leaves A) Also, we can see that the ratio of their speeds is 4 : 1

$\Rightarrow$  the times taken will be  $\frac{1}{(4+1)} \times 60$  min and

$$\frac{1}{(4+1)} \times 60 \text{ min} = 12 \text{ min and } 48 \text{ min respectively.}$$

The first train is delayed for 20 min and then it doubles its speed i.e. it takes only 6 minutes to reach B.  
 $\therefore$  If the second train has to reach on schedule, then it has only  $60 - (20 + 6) = 34$  minutes to make the journey from B to A.  $\therefore$  The ratio of speed of the second train to that of first train

$$= \frac{(1/\text{time taken by second train})}{(1/\text{time taken by first train})} = \frac{6}{34} \\ \approx 1 : 6$$

Choice (4)



$$= 36 \times 1 + 15 \times 1 + 35 \times 1 + 14 \times 1 = 102$$

So, the area covered in successive trips is 116, 108, 102, 98 and so on.

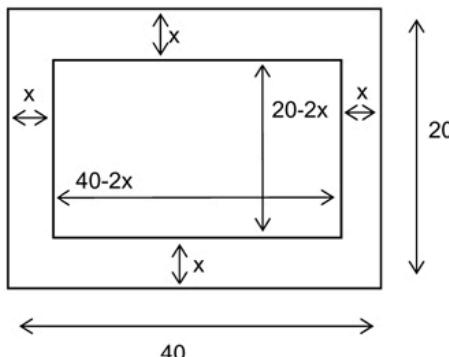
Total area of the lawn =  $20 \times 40 = 800$  sq.m

Half the lawn = 400 sq.m

∴ If he takes 4 trips he covers 424 sq.m

To cover 400 sq.m he requires 3.8 trips. Choice (3)

Alternately:



Let  $x$  be the number of times Neeraj moves about before he has moved half the lawn.

i.e. the width covered by Neeraj is  $x$  metres from each of the four sides. ∴ The area of the portion yet to be moved = area of the inner rectangle =  $\frac{1}{2}x$  the area of the bigger rectangle.

$$\Rightarrow (40 - 2x)(20 - 2x) = \frac{1}{2}x \times 800$$

$$\Rightarrow 4x^2 - 120x + 400 = 0$$

$$\Rightarrow x^2 - 30x + 100 = 0$$

$$\Rightarrow x = 15 \pm 5\sqrt{5}$$
 (since  $x < 20/2$ )

$$x = 15 - 5\sqrt{5} \approx 3.8$$
 (approximately)

So,

Choice (3)

71. The owner of a local jewellery store hired 3 watchmen to guard his diamonds, but a thief still got in and stole some diamonds. On the way out, the thief met each watchman, one at a time. To each he gave  $\frac{1}{2}$  of the diamonds he had then, and 2 more besides. He escaped with one diamond. How many did he steal originally?

- (1) 40  
(2) 36  
(3) 25  
(4) None of these

**Solution:**

Let  $x$  be the number of diamonds stolen by the thief originally. To the first watchman he gave  $(x/2 + 2)$  diamonds. ∴ Remaining diamonds =  $x/2 - 2$

Diamonds given to the second watchman

$$= \frac{1}{2}(x/2 - 2) + 2 = x/4 + 1$$

∴ Remaining diamonds with thief

$$= (x/2 - 2) - (x/4 + 1) = x/4 - 3$$

Diamonds given to the last watchman

$$= \frac{1}{2}(x/4 - 3) + 2 = x/8 + \frac{1}{2}$$

∴ Diamonds left with the thief

$$= (x/4 - 3) - (x/8 + \frac{1}{2}) = 1$$

$$\Rightarrow x/8 = 9/2 \Rightarrow x = 36$$

Choice (2)

72. Mayank, Mirza, Little and Jaspal bought a motorbike for \$60.00. Mayank paid one half of the sum of the amounts paid by the other boys, Mirza paid one third of the sum of the amounts paid by the other boys; and Little paid one fourth of the sum of the amounts paid by the other boys. How much did Jaspal have to pay?

- (1) 15  
(2) 13  
(3) 17  
(4) None of these

**Solution:**

Let Mayank pay  $x$  dollars; Mirza pay  $y$  dollars; Little pay  $z$  dollars and Jaspal pay  $w$  dollars

$$x + y + z + w = 60 \rightarrow (1)$$

$$x = \frac{1}{2}(y + z + w) \rightarrow (2)$$

$$y = \frac{1}{3}(x + z + w) \rightarrow (3)$$

$$z = \frac{1}{4}(x + y + w) \rightarrow (4)$$

∴ From eqn. (4)

$$x + y + w = 4z \quad \text{substituting in eqn (1)}$$

$$z + 4z = 60 \Rightarrow z = 12 \quad \text{from eqn (2)}$$

$$2x = y + z + w \quad \text{substituting in eqn (1)}$$

$$x + 2x = 60 \Rightarrow x = 20 \text{ similarly, } y = 15$$

$$\therefore w = 60 - (20 + 15 + 12)$$

$$= \$13$$

Choice (2)

73. A rich merchant had collected many gold coins. He did not want anybody to know about them. One day, his wife asked, "How many gold coins do we have?" After pausing a moment, he replied, "Well! If I divide the coins into two unequal numbers, then 48 times the difference between the two numbers equals the difference between the squares of the two numbers." The wife looked puzzled. Can you help the merchant's wife by finding out how many gold coins the merchant has?

- (1) 96

- (2) 53

- (3) 43

- (4) None of these

**Solution:**

Let the number of gold coins be  $n$ .

Let him divide this into two unequal numbers  $x$  and  $y$

$$x + y = n \text{ and } 48(x - y) = x^2 - y^2$$

$$\Rightarrow x + y = 48 = n$$

Choice (4)

74. Shyam visited Ram on vacation. In the mornings, they both would go for yoga. In the evenings they would play tennis. To have more fun, they indulge only in one activity per day, i.e., either they went for yoga or played tennis each day. There were days when they were lazy and stayed home all day long. There were 24 mornings when they did nothing, 14 evenings when they stayed at home, and a total of 22 days when they did yoga or played tennis. For how many days Shyam stayed with Ram?

- (1) 32

- (2) 24

- (3) 30

- (4) None of these

**Solution:**

Let  $x$  be the total number of days Shyam stayed with Ram.

$y$  be the no. of days they did yoga and  $t$  be the no. of days they played tennis

$$\text{Given, } x - y = 24 \rightarrow (1) \quad x - t = 14 \rightarrow (2)$$

$$\text{and } y + t = 22 \rightarrow (3) \quad (1) + (2) \Rightarrow 2x - (y + t) = 38$$

$$\Rightarrow 2x = 60; \quad x = 30$$

Choice (3)

75. Let  $S$  denote the infinite sum  $2 + 5x + 9x^2 + 14x^3 + 20x^4 + \dots$ , where  $|x| < 1$  and the coefficient of

$x^{n-1}$  is  $\frac{1}{2}n(n+3)$ , ( $n=1,2,\dots$ ). Then  $S$  equals

$$(1) \quad \frac{2-x}{(1-x)^3}$$

$$(2) \quad \frac{2-x}{(1+x)^3}$$

$$(3) \quad \frac{2+x}{(1-x)^3}$$

$$(4) \quad \frac{2+x}{(1+x)^3}$$

**Solution:**

$$S = 2 + 5x + 9x^2 + 14x^3 + 2x^4 + \dots \alpha \rightarrow (1)$$

$$xS = 2x + 5x^2 + 9x^3 + 14x^4 + 205 \rightarrow (2)$$

(1) - (2) gives

$$(1-x)S = 2 + 3x + 4x^2 + 5x^3 + 6x^4 + \dots \alpha \rightarrow (3)$$

$$x(1-x)S = 2x + 3x^2 + 4x^3 + 5x^4 + 6x^5 + \dots \rightarrow (4)$$

(3) - (4) gives

$$(1-x)^2 S = 2 + x + x^2 + x^3 + x^4 + \dots \rightarrow (5)$$

$$(1-x)^2 S = 2 + \frac{x}{1-x}$$

$$S = \frac{2-x}{(1-x)^3}$$

Choice (1)

76. If  $x^2 + 5y^2 + z^2 = 2y(2x + z)$  then which of the following statements are necessarily true?

- A.  $x = 2y$       B.  $x = 2z$       C.  $2x = z$   
 (1) Only A                  (2) Only B and C  
 (3) Only A and B            (4) None of these

**Solution:**

$$\text{Given, } x^2 + 5y^2 + z^2 = 4xy + 2yz$$

$$(x^2 + 4y^2 - 4xy) + (y^2 + z^2 - 2yz)$$

$$\Rightarrow (x-2y)^2 + (y-z)^2 = 0 \Rightarrow x-2y = 0 \text{ and } y-z = 0$$

$$\Rightarrow x = 2y \text{ and } y = z$$

$$x = 2y \Rightarrow x = 2z$$

Choice (3)

77. Amol was asked to calculate the arithmetic mean of ten positive integers each of which had two digits. By mistake, he interchanged the two digits, say a and b, in one of these ten integers. As a result, his answer for the arithmetic mean was 1.8 more than what it should have been. Then b - a equals

- (1) 1                          (2) 2  
 (3) 3                          (4) None of these

**Solution:**

Let a be the ten's digit and b be the unit's digit of number whose digits were interchanged. Since the average of the 10 numbers increased by 1.8,

$\Rightarrow$  their sum will be increased by  $1.8 \times 10 = 18$

$$\Rightarrow (10b + a) - (10a + b) = 18$$

$$\Rightarrow 9(b-a) = 18 \Rightarrow b-a = 2.$$

Choice (2)

78. A car rental agency has the following terms. If a car is rented for 5 hours or less the charge is Rs.60 per hour or Rs.12 per kilometre whichever is more. On the other hand, if the car is rented for more than 5 hours, the charge is Rs.50 per hour or Rs.7.50 per kilometre whichever is more. Akil rented a car from this agency, drove it for 30 kilometers and ended up paying Rs.300. For how many hours did he rent the car?

- (1) 4                          (2) 5  
 (3) 6                          (4) None of these

**Solution:**

The best approach is to go by the answer choices for 4 hours  $\rightarrow$  and 30 km,

we have max (4 x 60, 12 x 30) = Rs.360

For 5 hours  $\rightarrow$  and 30 km,

We have max (5 x 60, 12 x 30) = Rs.360

For 6 hours  $\rightarrow$  and 30 km,

We have max (6 x 50 to 7.5 x 30) = Rs.300

Choice (3)

79. A child was asked to add first few natural numbers (that is, 1 + 2 + 3 + ..... so long his patience permitted. As he stopped, he gave the sum as 575. When the teacher declared the result wrong the child discovered he had missed one number in the sequence during addition. The number he missed was:

- (1) less than 10                  (2) 10  
 (3) 15                          (4) more than 15

**Solution:**

Let n be number up which the child has added and m be the missed number then,  $\frac{n(n+1)}{2} = 575 + m$

$$n(n+1) = 1150 + 2m ; \text{ when } n = 33$$

$$\text{LHS} = 1122 \Rightarrow m = -14$$

When = 34

$$\text{LHS} = 1190 \Rightarrow m = 20$$

When n = 35

$$\text{LHS} = 1260 \Rightarrow m = 55$$

Now, as m is a natural number and should be less than or equal to n,  $\therefore m = 20$       Choice (4)

80. Suppose, for any real number x,  $\lfloor x \rfloor$  denotes the greatest integer less than or equal to x. Let  $L(x, y) = \lfloor x \rfloor + \lfloor y \rfloor + \lfloor x+y \rfloor$  and  $R(x, y) = \lfloor 2x \rfloor + \lfloor 2y \rfloor$ . Then it's impossible to find any two positive real numbers x and y for which

- (1)  $L(x, y) = R(x, y)$       (2)  $L(x, y) > R(x, y)$   
 (3)  $L(x, y) < R(x, y)$       (4)  $L(x, y) > R(x, y)$

**Solution:**

Eliminate the choices by assuming some numbers

$$x = 1.2$$

$$y = 1.2 \Rightarrow L(x, y) = R(x, y) \text{ or if } x = 1.6$$

$$y = 1.6$$

$$L(x, y) < R(x, y)$$

Hence, choices (1), (2), and (3) are eliminated.

Choice (4)

81. 10 straight lines, no two of which are parallel and no three of which pass through any common point, are drawn on a plane. The total number of regions (including finite and infinite regions) into which the plane would be divided by the lines is

- (1) 56                          (2) 255  
 (3) 1024                          (4) not unique

**Solution:**

When n straight lines, no two of which are parallel and no three of which are concurrent, are drawn, the number of regions into which the plane is divided is given by  $(\Sigma n) + 1$ , here, n = 10

$$\Rightarrow \Sigma n + 1 = 55 + 1 = 56$$

$\therefore$  The number of regions into which the plane can be divided is 56.      Choice (1)

82. When  $2^{256}$  is divided by 17 the remainder would be

- (1) 1                          (2) 16  
 (3) 14                          (4) None of these

**Solution:**

$$\left[ \frac{2^{256}}{17} \right] = \left[ \frac{16^{64}}{17} \right] = \left[ \frac{16^{64}}{16 - (-1)} \right]$$

Applying Remainder's theorem  $= (-1)^{64} = 1$

$\therefore$  Remainder = 1      Choice (1)

83. The number of real roots of the equation  $A^2 + \frac{B^2}{x} = 1$ , where A and B are real numbers not equal to zero simultaneously is  
 (1) None (2) 1 (3) 2 (4) 1 or 2

**Solution:**

$$\text{Given, } \frac{A^2}{x} + \frac{B^2}{x-1} = 1 \text{ If either } A = 0 \text{ or } B = 0$$

We have one value for x.

When none of them is zero, we have

$$A^2(x-1) + B^2x = x^2 - x \\ \Rightarrow x^2 - x(A^2 + B^2 + 1) + A^2 = 0$$

If the above quadratic equation has to have real roots then  $(A^2 + B^2 + 1)^2 - 4A^2$  (must be)  $\geq 0$

$$(A^2 - 2A + 1 + B^2)(A^2 + 2A + 1 + B^2)$$

$$((A-1)^2 + B^2)((A+1)^2 + B^2) \geq 0$$

So, the above quadratic equation can have 2 distinct roots.

So, the original equation can have either one root or two roots.  
 Choice (4)

84. At a bookstore, "MODERN BOOK STORE" is flashed using neon lights. The words are individually flashed at intervals of  $2\frac{1}{2}$ ,  $4\frac{1}{4}$ ,  $5\frac{1}{8}$  seconds respectively, and each word is put off after a second. The least time after which the full name of the bookstore can be read again is:  
 (1) 49.5 seconds (2) 73.5 seconds  
 (3) 1744.5 seconds (4) 855 seconds

**Solution:**

Let at t = 0 all of them flash together.

"MODERN" flashes after every  $(1 + 2\frac{1}{2}) = 3\frac{1}{2}$  sec.

"BOOK" flashes after every  $(1 + 4\frac{1}{4}) = 5\frac{1}{4}$  sec.

"STORE" flashes after every  $(1 + 5\frac{1}{8}) = 6\frac{1}{8}$  sec.

$\therefore$  The LCM of  $3\frac{1}{2}, 5\frac{1}{4}, 6\frac{1}{8} = 73.5$  seconds

Choice (2)

85. Three pieces of cakes of weight  $4\frac{1}{2}$  lbs,  $6\frac{3}{4}$  lbs and  $7\frac{1}{5}$  lbs respectively are to be divided into parts of equal weights. Further, each part must be as heavy as possible. If one such part is served to each guest, then what is the maximum number of guests that could be entertained?

- (1) 54 (2) 72  
 (3) 20 (4) None of these

**Solution:**

Let the 3 pieces be  $C_1, C_2$  and  $C_3$ .

$C_1$  weighs  $9/2$  pounds.

$C_2$  weighs  $27/4$  pounds.

$C_3$  weighs  $36/5$  pounds.

Since each of the three pieces is divided into equal parts of maximum possible weight, each part weighs HCF ( $9/2, 27/4$  and  $36/5$ ) pounds i.e.,  $9/20$  pounds.

The number of guests that could be entertained with exactly one part being served to each guest

$$= \frac{9}{2} + \frac{27}{4} + \frac{36}{5} = 41 \quad \text{Choice (4)}$$

20

86. After the division of a number successively by 3, 4, and 7, the remainders obtained are 2, 1 and 4 respectively. What will be the remainder if 84 divides the same number?

- (1) 80 (2) 76 (3) 41 (4) 53

**Solution:**

A number when successively divided by 3, 4 and 7 leaves a remainder of 2, 1 and 4 respectively.

$$\begin{array}{ccccccc} 3 & & 4 & & 7 \\ \downarrow & \swarrow & \downarrow & \searrow & \downarrow \\ 2 & & 1 & & 4 \end{array}$$

$\therefore$  The number is of the form  $84k + 53$ . So, it leaves a remainder of 53 when divided by 84. Choice (4)

87. Six persons are playing a card game, Suresh is facing Raghbir who is to the left of Ajay and to the right of Pramod. Ajay is to the left of Dhiraj. Yogendra is to the left of Pramod. If Dhiraj exchanges his seat with Yogendra and Pramod exchanges with Raghbir, who will be sitting to the left of Dhiraj?

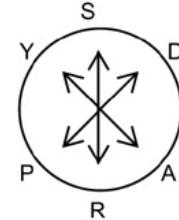
- (1) Yogendra (2) Raghbir  
 (3) Suresh (4) Ajay

**Solution:**

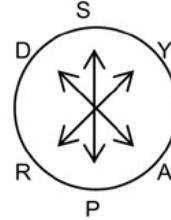
Since persons are playing a card game.

Suresh is facing Raghbir who is to the left of Ajay and to the right of Pramod.

Ajay is to the left of Dhiraj and Yogendra is to the left of Pramod.



Now, when Dhiraj exchanges his seat with Yogendra and Pramod exchanges with Raghbir, the position is



So, Suresh is sitting left to Dhiraj. Choice (3)

**Directions for questions 88 and 89:** Answer these questions based on the information given below.

A boy is asked to put in a basket one mango when ordered 'One'. One orange when ordered 'Two', one apple, when ordered 'Three' and is asked to take out from the basket one mango and an orange when ordered 'Four'. A sequence of orders is given as:  
 1 2 3 3 2 1 4 2 3 1 4 2 2 3 3 1 4 1 1 3 2 3 4.

88. How many total oranges were in the basket at the end of the above sequence?

- (1) 1 (2) 4 (3) 3 (4) 2

89. How many total fruits will be in the basket at the end of the above order sequence?  
 (1) 9      (2) 8      (3) 11      (4) 10

**Solutions for questions 88 to 89:**

'One' means add one mango; 'two' means add one apple; 'three' means add one orange; 'four' means remove one mango and one orange from the basket.

The sequence of orders given is

12332142314223314113234

88. Number of oranges left at the end of above sequence = number of two's – number of four's  
 $= 6 - 4 = 2$       Choice (4)

89. Total number of fruits left at the end of the above sequence = number of one's + number of two's + number of three's – 2 x (number of fours)  
 $= 6 + 6 + 7 - 2 \times 4 = 19 - 8 = 11$       Choice (3)

**Directions for questions 90 and 91:** Answer these questions based on the information given below.

Each of the 11 letters A, H, I, M, O, T, U, V, W, X, and Z appears same when looked at in a mirror. They are called symmetric letters. Other letters in the alphabet are asymmetric letters.

90. How many four-letter computer passwords can be formed using only the symmetric letters (no repetition allowed)?  
 (1) 7920      (2) 330  
 (3) 14640      (4) 419430

91. How many 3-letter computer passwords can be formed (no repetition allowed) with at least one symmetric letter?  
 (1) 990      (2) 2730      (3) 12870      (4) 15600

**Solutions for questions 90 to 91:**

Out of the 26 letters in the English Alphabet, 11 are symmetric and 15 are asymmetric.

90. The number of 4 lettered words that can be formed using the 11 symmetric letters =  ${}^{11}P_4$  (without repetition) =  $11 \times 10 \times 9 \times 8 = 7920$       Choice (1)
91. The number of 3 letter words that can be formed with atleast one symmetric letter = The number of 3 lettered words that can be formed using all the 26 letters – the number of 3 lettered words that can be formed using the 15 asymmetric letter words.  
 $= {}^{26}P_3 - {}^{15}P_3 = (26 \times 25 \times 24) - (15 \times 14 \times 13)$   
 $= 15600 - 2730 = 12870$       Choice (3)

**Directions for questions 92 to 100:** Answer the questions independent of each other.....

92. A train approaches a tunnel AB. Inside the tunnel is a cat located at a point that is  $\frac{3}{8}$  of the distance AB measured from the entrance A. When the train whistles the cat runs. If the cat moves to the entrance of the tunnel, A, the train catches the cat exactly at the entrance. If the cat moves to the exit, B, the train catches the cat exactly at the exit. The speed of the train is greater than the speed of the cat by what order?

- (1) 3 : 1      (2) 4 : 1  
 (3) 5 : 1      (4) None of these

**Solution:**

Let L be the length of the tunnel AB. Let the cat be at a point C where AC =  $\frac{3}{8}$ L.

If the cat moves towards A (after listening to the whistle), the train and the cat reach A at the same time i.e., by the time the train (the head of the train) reaches A, the cat travels  $\frac{3}{8}$ L. It is given that the train would meet the cat at the end B, if the cat travels from C towards B (after listening to the whistle). When the cat moves towards B, it would be  $\frac{5}{8}$ L away from A by the time the head of the train reaches A.

⇒ By the time the train travels a distance of L, the cat travels (remaining  $L - \frac{3}{8}L = \frac{5}{8}L$ )  $\frac{5}{8}L$

∴ The ratio of the speed of the train to the speed of the cat = 4 : 1      Choice (2)

93. A piece of string is 40 centimeters long. It is cut into three pieces. The longest piece is 3 times as long as the middle sized piece and the shortest piece is 23 centimeters shorter than the longest piece. Find the length of the shortest piece.

- (1) 27      (2) 5      (3) 4      (4) 9

**Solution:**

Let m be the middle sized string.

The largest piece = 3m

The shortest piece =  $m - 23$

The total length =  $7m - 23 = 40$

⇒  $m = 9\text{cm}$

∴ The shortest piece =  $3 \times 9 - 23 = 4\text{ cm}$

Choice (3)

94. Three travelers are sitting around a fire, and are about to eat a meal. One of them has five small loaves of bread, the second has three small loaves of bread. The third has no food, but has eight coins. He offers to pay for some bread. They agree to share the eight loaves equally among the three travelers, and the third traveler will pay eight coins for his share of eight loaves. All loaves were the same size. The second traveler (who had three loaves) suggests that he be paid three coins and that the first traveler be paid five coins. The first traveler says that he should get more than five coins. How much the first traveler should get?

- (1) 5      (2) 7  
 (3) 1      (4) None of these

**Solution:**

Given that the first traveller has 5 loaves of bread and the second traveler has 3 loaves of bread.

When first, second and third traveller share the bread equally among themselves, each gets  $\frac{8}{3}$  loaves of bread.

Contribution of the first traveller to the third traveller =  $5 - \frac{8}{3} = \frac{7}{3}$  loaves.

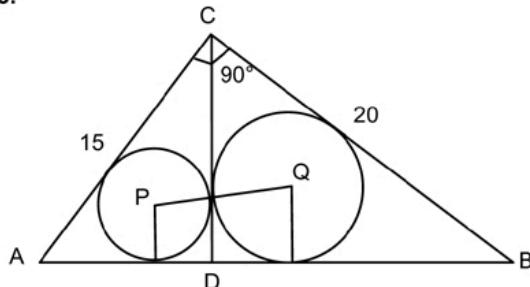
Contribution of the second traveller to the third traveller

=  $3 - \frac{8}{3} = \frac{1}{3}$  loaf

The 8 coins given by the third traveller must be shared among the first and second travellers in the ratio of their contributions. i.e., the first traveller must get  $\frac{7}{8} \times 8 = 7$  coins.

Choice (2)

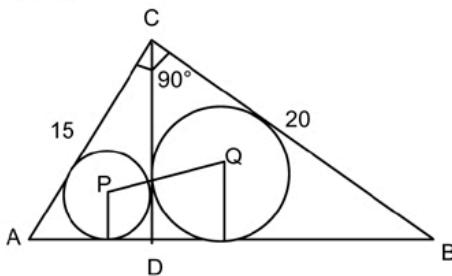
95.



In the above figure,  $ACB$  is a right angled triangle.  $CD$  is the altitude. Circles are inscribed within the triangles  $ACD$ ,  $BCD$ .  $P$  and  $Q$  are the centres of the circles. The distance  $PQ$  is

- (1) 5      (2)  $\sqrt{50}$       (3) 7      (4) 8

**Solution:**



$AB = 25$  [Pythagoras theorem]

$$\frac{1}{2} \times 15 \times 20 = \frac{1}{2} CD \times 25$$

$$CD = 12$$

Since,  $CD = 12$ ;  $AC = 15$ ;  $AD = 9$  also  $CD = 12$ ,  $CB = 20$ ,  $DB = 15$

Now in radius of a triangle = Area of  $\Delta$ le/ $\frac{1}{2}$  Perimeter  
 $r_1 = 54/18 = 3$

$$r_2 = 96/24 = 4$$

If D is origin  $P = (-r_1, r_1)$ ;  $Q = (r_2, r_2)$

$$\therefore \text{Distance} = \sqrt{(3+4)^2 + (3-4)^2}$$

$$= \sqrt{49+1} = \sqrt{50}$$

Choice (2)

96. If  $u$ ,  $v$ ,  $w$  and  $m$  are natural numbers such that  $u^m + v^m = w^m$ , then one of the following is true.

- (1)  $m \geq \min(u, v, w)$   
 (2)  $m \geq \max(u, v, w)$   
 (3)  $m < \min(u, v, w)$   
 (4) None of these

**Solution:**

$$u^m + v^m = w^m \rightarrow (1)$$

Where  $u$ ,  $v$ ,  $w$ ,  $m$  are natural numbers.

Take the possibility of  $m = 1$ ,  $u = 1$ ,  $v = 2$ ,  $w = 3$   
 then  $1^1 + 2^1 = 3^1$

$\Rightarrow m = \min$  of  $(u, v, w)$

$\therefore$  Choice (2) and (3) are eliminated.

Similarly if  $u = 2$ ,  $v = 3$  and  $w = 5$  and  $m = 1$   
 $2^1 + 3^1 = 5^1$

but  $m$  is not greater than or equal to  $\min(2, 3, 5)$

Choice (4)

Note: - Using Fermat's theorem – A very famous theorem

$A^n + B^n = C^n$  only for  $n \leq 2$ , where  $A$ ,  $B$ ,  $C$  and  $n$  are natural numbers.

97. In how many ways is it possible to choose a white square and a black square on a chess board so that the squares must not lie in the same row or column?

- (1) 56      (2) 896      (3) 60      (4) 768

**Solution:**

There are 32 white squares and 32 black squares on a chess board.

In each row or column there are 4 white squares and 4 black squares.

When any white square is selected, there are 8 black squares along the row and column containing that white square. i.e., there are  $24(32 - 8)$  black squares which do not lie in the same row or column of any white square. So far each of the 32 white squares there are 24 possible black squares satisfying the given conditions.

So the number of ways the required selection can be made is  $32 \times 24 = 768$  ways. Choice (4)

98.  $7^{6n} - 6^{6n}$ , where  $n$  is an integer  $> 0$ , is divisible by

- (1) 13      (2) 127  
 (3) 559      (4) All of these

**Solution:**

$$7^{6n} - 6^{6n} = (7^2)^{3n} - (6^2)^{3n} \\ = 49^{3n} - 36^{3n}$$

which is divisible by 13

$$= (7^6)^n - (6^6)^n \text{ is divisible by } 7^6 - 6^6$$

$$7^6 - 6^6 = (7^3 - 6^3)(7^3 + 6^3)$$

$$= 127 \times 559$$

$\therefore 7^{6n} - 6^{6n}$  is divisible by 13, 127 and 559

Choice (4)

99. If  $pqr = 1$ , the value of the expression

$$\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}}$$

- (1)  $p + q + r$       (2)  $\frac{1}{p+q+r}$   
 (3) 1      (4)  $p^{-1} + q^{-1} + r^{-1}$

**Solution:**

If  $pqr = 1$

$$\text{Let } E = \frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}} \\ \frac{q}{q+qp+1} + \frac{r}{r+rq+1} + \frac{1}{1+r+1/p}$$

Given  $pqr = 1 \Rightarrow qp = 1/r$  and  $1/p = qr$

$$\frac{q}{1+q+q^{-1}} + \frac{r}{r+rq+1} + \frac{1}{1+r+qr}$$

$$\frac{qr}{qr+1+r} + \frac{r}{r+rq+1} + \frac{1}{1+r+qr} = \frac{qr+r+1}{qr+1+r} = 1$$

Alternately : (let  $p = q = r = 1$ )

$$= \frac{1}{1+1+1^{-1}} + \frac{1}{1+1+r^{-1}} + \frac{1}{1+1+p^{-1}}$$

=  $1/3 + 1/3 + 1/3 = 1$ ; when  $p = q = r = 1$   
 only one option is 1.

$$\therefore E = 1$$

Choice (3)



### 103. Catch

	Dictionary Definition		Usage
A.	Capture	E.	All her friends agreed that Prasad was a good catch.
B.	Grasp with senses or mind	F.	The proposal sounds very good but where is the catch?
C.	Deception	G.	Hussain tries to catch the spirit of India in this painting.
D.	Thing or person worth trapping	H.	Sorry, I couldn't catch you.

(1)	A   H
	B   F
	C   E
	D   G

(2)	A   F
	B   G
	C   E
	D   H

(3)	A   G
	B   F
	C   E
	D   H

(4)	A   G
	B   H
	C   F
	D   E

#### Solution:

'A' says the meaning of "catch" is capture.'G' matches 'A'. 'G' says Hussain tries to catch (Capture) the spirit of India in the painting. Hence, AG is the appropriate matching. It is found in Choices (3) and (4). In 'B', the other meaning of 'catch' is 'Grasp with senses or mind.' Statement 'H' reflects the same. Hence, 'H' matches B. These combinations are found in Choice (4). Hence (4) is the answer.

Choice (4)

### 104. Deal

	Dictionary Definition		Usage
A.	Manage, attend to	E.	Dinesh insisted on dealing the cards.
B.	Stock, sell	F.	This contract deals with handmade cards.
C.	Give out to a number of people	G.	My brother deals in cards.
D.	Be concerned with	H.	I decided not to deal with handmade cards.

(1)	A   F
	B   E
	C   G
	D   H

(2)	A   H
	B   G
	C   E
	D   F

(3)	A   F
	B   H
	C   G
	D   E

(4)	A   H
	B   E
	C   G
	D   F

#### Solution:

In 'A', 'deal' is defined as manage. the example in 'H'. [I decided not to deal (manage) with handmade cards] reflects the same. Hence, AH is the appropriate combination. It is found in choices (2) and (4). Statement 'G' conveys the meaning as expressed in B.Hence, B matches G. These combinations are found only in choice (2). Hence, (2) is the answer.

Choice (2)

### 105. Turn

	Dictionary Definition		Usage
A.	Give new direction to	E.	It was now his turn to be angry.
B.	Send	F.	Leena never turned away a beggar.
C.	Change in form	G.	Ashish asked Laxman to turn his face to the left.
D.	Opportunity coming successively for each person	H.	The old school building has been turned into a museum.

(1)	A   H
	B   E
	C   F
	D   G

(2)	A   G
	B   F
	C   E
	D   H

(3)	A   G
	B   E
	C   F
	D   H

(4)	A   G
	B   F
	C   H
	D   E

#### Solution:

'A' defines 'Turn' as 'give new direction' to. This idea is reflected in G. AG is found in choices (2), (3) and (4). In 'B', 'turn', is defined as 'send'. It is expressed in F. Thus it is understood that BF is appropriate matching. The combinations AG and BF are found in Choices (2) and (4). Further, 'C' says. 'turn' means 'change in form'. The same is reflected in H. The combination AG, BF and CH are found in (4). It is the appropriate choice.

Choice (4)

**Directions for questions 106 to 110:** The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.



**Solution:**

From the choices it is clear that A is the opening sentence. 'D' follows 'A'. It says that the demand for branded diapers is price sensitive because of the high availability of the same (stated in A). Hence, A followed by D is the most appropriate combination. Further, 'B' is a continuation of the idea expressed in D. The combination ADB is found only in Choice (3). Choice (3)

107.

  - A. Having a strategy is a matter of discipline.
  - B. It involves the configuration of a tailored value chain that enables a company to offer unique value.
  - C. It requires a strong focus on profitability and a willingness to make tough tradeoffs in choosing what not to do.
  - D. Strategy goes far beyond the pursuit of best practices.
  - E. A company must stay the course even during times of upheaval, while constantly improving and extending its distinctive positioning.
  - F. When a company's activities fit together as a self-reinforcing system, any competitor wishing to imitate a strategy must replicate the whole system.

(1) ACEDBF                          (2) ACBDEF  
(3) DCBEFA                          (4) ABCEDF

**Solution:**

From the given choices either A or D may open the paragraph. 'A' is the better of the two to open the paragraph. 'A' introduces the topic, it says that having a strategy is a matter of discipline. 'C' is the appropriate statement to follow 'A'. 'It' in 'C' refers to strategy and the words "Choosing what not to do" in 'C' refers to the word "discipline" mentioned in A. In Choices (1) and (2) we find the combination AC. Now, we have to decide between E and B to follow 'C'. 'B' is not the appropriate statement to follow 'C'. It refers to tailored value chain that enables a company to offer unique

value. It has no direct relation with the previous statement. Hence, Choice (2) can be ruled out. 'E' is the appropriate statement to follow 'C'. the word 'tough tradeoffs' in 'C' finds a combination in 'E'. The words, "A company must stay the course even during times of upheaval" convey it. Further, DB strengthens the idea and F concludes the statement.



### Solution:

From the choices, 'B' is the opening statement. Now we must decide between 'C' or 'E' to follow B. E is the appropriate statement to follow B. 'They' in E refers to "ambassadors". It says it is necessary for ambassadors to live ceremonial lives. Further, 'A' is the continuation of the idea expressed in E. 'C' concludes the paragraph. Hence BEADC. Choice (3)



**Solution:**

'E' is the appropriate statement to open the paragraph. It says the economic impact of an inadequate monsoon had been sounded by most of the states in late July and August. In choices (1) and (4) we find E as the opening sentence. Now, we must decide between B or C to follow E. 'C' is the appropriate statement to follow E. The words "line of divide between the two" refers to the center and state mentioned in E. 'B' lays stress on the idea of the central government on the impact of drought subsequently D and A follow. Hence ECBDA.

**Solution:**

From the choices B or E may open the paragraph. 'E' following B is a better combination. 'B' says, 'one of the unsettled scientific questions in the late 18<sup>th</sup> century was the nature of the shape of the earth.' E is an extension of the idea expressed in B. The combination BE is found in (1) and (2). Now, we must decide between C or D to follow E. 'D' says one way of determining the shape is to determine the length of the arc. Further, 'C' tells us about the length of one degree arc. 'A' is better as a concluding statement. Hence BEDCA . Choice (2)

### Choice (2)

**Directions for questions 111 to 116:** Fill the gaps in the passages below with the most appropriate word from the options given for each gap. The right words are the ones used by the author. Be guided by the author's overall style and meaning when you choose the answer.

Von Neumann and Morgenstern assume a decision framework in which all options are thoroughly considered, each option being independent of the others, with a numerical value derived for the utility of each possible outcome (these outcomes reflecting, in turn, all possible combinations of choices). The decision is then made to maximize the expected utility.

(111)....., such a model reflects major simplifications of the way decisions are made in the real world. Humans are not able to process information as quickly and effectively as the model assumes; they tend not to think (112)..... as easily as the model calls for; they often deal with a particular option without really assessing its (113)....., and when they do assess alternatives, they may be extremely nebulous about their criteria of evaluation.



**Solution:**

The passage states that Von Neumann and Morgenstern assume a decision in which all options are thoroughly considered. The decision is then made to maximize the expected utility. The right word to be inserted into blank is obviously

(easily seen or understood,) such a model reflects major simplifications of the way decisions are made in the world. From the choices, 'apparently' is synonymous with 'obviously'. But apparently means according to the way it appears. Hence, it does not suit the context.

The words 'regrettably' (to feel sorry about something), 'firstly' (used to introduce the first of a list of points . . .) are not suitable. Choice (3)

- 112.** (1) quantitatively      (2) systematically  
         (3) scientifically      (4) analytically

### Solution:

Humans are not able to process . . . . . they tend not to think quantitatively (related to or measured by quantity).

Systematically – (according to a plan)

Scientifically – (relating to or based on science)

Analytically – (having to do with analysis, logical)

The appropriate word suitable to the context is 'quantitatively' because the words "process information as quickly and effectively as the model assumes" indirectly hint at quantitative thinking

**Choice (1)**



### Solution:

They often deal with a particular option without really assessing its alternatives (used to introduce a suggestion that there is a second choice) the remaining words 'implications', disadvantages and 'utility' also can fit into the blank, but choice (4) is the most appropriate word because the part of the sentence following it says, " . . . . . , and when they do assess alternatives, they may be extremely nebulous about their evaluation."

Choice (4)

In a large company, (114)..... people is about as common as using a gun or a switch-blade to (115)..... an argument. As a result, most managers have little or no experience of firing people, and they find it emotionally traumatic ; as a result, they often delay the act interminably, much as an unhappy spouse will prolong a bad marriage. And when the firing is done, it's often done clumsily, with far worse side effects than are necessary.

Do the world-class software organizations have a different way of firing people? No, but they do the deed swiftly, humanely, and professionally.

The key point here is to view the fired employee as a "failed product" and to ask how the process (116).....such a phenomenon in the first place.



### Solution:

Choice (3) is the most appropriate word. Firing people (in the context it means dismiss an employee from job). "Firing", is a better word than "dismissing" because if we read the passage completely, we find that the tone is informal, hence "firing" is suitable in the context. Choice (3)

**Solution:**

Further the passage says that it is as common as using a gun or a switch-blade to resolve an argument (find a solution to something). The remaining choices are not contextually suitable.

### Choice (1)



**Solution:**

The passage says that the world class software organizations deal with the situation professionally. They view the fired employee as a "failed product" and to ask how the process 'allowed' (permit to do something) such a phenomenon. The remaining choices are not suitable in the context.

(derived – obtained from something)  
(engineered – skillfully arrange to occur)  
(produced – to produce something) Choice (4)

**Directions for questions 117 to 120:** In each of the questions below, four different ways of writing a sentence are indicated. Choose the best way of writing the sentence.

117. A. The main problem with the notion of price discrimination is that it is not always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

B. The main problem with the notion of price discrimination is not that it is always a bad thing, it is the monopolist who has the power to decide who is charged what price.

C. The main problem with the notion of price discrimination is not that it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

D. The main problem with the notion of price discrimination is not it is always a bad thing, but that it is the monopolist who has the power to decide who is charged what price.

(1) A      (2) B      (3) C      (4) D

### Solution:

In the given statement, the error is in the usage of not only . . . . . but also. According to the rules of grammar, correlative conjunctions are paired. The appropriate sentence is the main . . . . . of price discrimination is not that it is always a bad thing, but that it is the monopolistic.....

### Choice (3)

118. A. A symbiotic relationship develops among the contractors, bureaucracy and the politicians, and by a large number of devices costs are artificially escalated and black money is generated by underhand deals.

B. A symbiotic relationship develops among contractors, bureaucracy and politicians, and costs are artificially escalated with a large number of devices and black money is generated through underhand deals.

- C. A symbiotic relationship develops among contractors, bureaucracy and the politicians and by a large number of devices costs are artificially escalated and black money is generated on underhand deals.
  - D. A symbiotic relationship develops among the contractors, bureaucracy and politicians and by large number of devices costs are artificially escalated and black money is generated by underhand deals.

(1) A      (2) B      (C) C      (4) D

### Solution:

In the given statements A and C the usage, " . . . . . 'bureaucracy and the politicians" is erroneous. The usage of a definite article is not appropriate. Again in A and C, the usage of "devices cost are artificially isolated" is erroneous. Further, "blackmoney is generated by underhand deals " is also a wrong usage. The meaning conveyed is totally changed. The statement which is grammatically correct is (B). Choice (2)

## Choice (2)

119. A. The distinctive feature of tariffs and export subsidies is that they create difference of prices at which goods are traded on the world market and their price within a local market.

B. The distinctive feature of tariffs and export subsidies is that they create a difference of price at which goods are traded with the world market and their prices in the local market.

C. The distinctive feature of tariffs and export subsidies is that they create a difference between price at which goods are traded on the world market and theirs prices within a local market.

D. The distinctive feature of tariffs and export subsidies is that they create a difference across price at which goods are traded with the world market and their prices within a local market.

(1) A      (2) B      (3) C      (4) D

**Solution:**

Statement B and D can be ruled out because 'traded with the world market' is incorrect. The preposition is 'on'. In A 'difference of prices' is incorrect, it should be 'difference between price'.  
Choice (3)

Choice (3)

120. A. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operations perceive and there by encourage excessive hedging.

B. Any action by government to reduce the systemic risk inherent in financial markets will also reduce the risks that private operators perceive and there by encourage excessive gambling.

C. Any action by government to reduce the systemic risk inherent due to financial markets will also reduce the risks that private operators perceive and there by encourages excessive hedging.

D. Any action of government to reduce the systemic risk inherent in financial markets will also reduce the risk that private operators perceive and thereby encourage excessive gambling.

- (1) A (2) B (3) C (4) D

**Solution:**

In statements A and D, the words "action of government" is wrongly used. The correct form is, "action by government" i.e., the steps taken by the Government. Further, in statements A and C the words, "encourage excessive hedging" are wrong. "Hedging" means making a number of conditions or exceptions. The correct expression is "encourage excessive gambling".

Choice (2)

**Directions for questions 121 to 125:** For each of the words below a context is provided. From the alternatives given pick the word or phrase that is closest in meaning in the given context.

**121. Opprobrium:** The police officer appears oblivious to the opprobrium generated by his blatantly partisan conduct.

- (1) Harsh criticism  
(2) Acute distrust  
(2) Bitter enmity  
(4) Stark oppressiveness

**Solution:**

The word which is closest in meaning to opprobrium is harsh criticism. Choice (1)

**122. Portend:** It appears to many that the US "War on terrorism" portends trouble in the Gulf.

- (1) Introduces (2) Evokes  
(3) Spells (4) Bodes

**Directions for questions 126 to 150:** Each of the five passages given below is followed by questions. Choose the best answer for each question.

**PASSAGE – 1**

The production of histories of India has become very frequent in recent years and may well call for some explanation. Why so many and why this one in particular? The reason is twofold – changes in the Indian scene requiring a re-interpretation of the facts and changes in attitudes of historians about the essential elements of Indian history. These two considerations are in addition to the normal fact of fresh information, whether in the form of archaeological discoveries throwing fresh light on an obscure period or culture, or the revelations caused by the opening of archives or the release of private papers. The changes in the Indian scene are too obvious to need emphasis. Only two generations ago British rule seemed to most Indians as well as British observers likely to extend into an indefinite future; now there is a teenage generation which knows nothing of it. Changes in the attitudes of historians have occurred everywhere, changes in attitudes to the content of the subject as well as to particular countries, but in India there have been some special features. Prior to the British, Indian historiographers were mostly Muslims, who relied, as in the case of Sayyid Ghulam Hussain, on their own recollection of events and on information from friends and men of affairs. Only a few like Abu'l Fazl had access to official papers. These were personal narratives of events, varying in value with the nature of the writer. The early British writers were officials. In the eighteenth century they were concerned with some aspect of Company policy, or, like Robert Orme in his *Military Transactions*, gave a straight narrative in what was essentially a continuation of the Muslim tradition. In the early nineteenth century the writers were still, with two notable exceptions, officials, but they were now engaged in chronicling, in varying moods of zest, pride, and awe, the rise of the British power in India to supremacy. The two exceptions were James Mill, with his critical attitude to the Company and John Marchman, the Baptist missionary. But they, like the officials, were anglo-centric in their attitude, so that the history of modern India in their hands came to be the history of the rise of the British in India.

**Solution:**

Portend means (a sign or warning that is likely to happen). The word nearest in meaning is bodes which means (sign of a good or bad outcome). Choice (4)

**123. Prevaricate:** When a videotape of her meeting was played back to her and she was asked to explain her presence there, she started prevaricating.

- (1) Speaking evasively  
(2) Speaking violently  
(3) Lying furiously  
(4) Throwing a tantrum

**Solution:**

The given word prevaricate means avoid giving a direct answer to a question. The word closest in meaning is 'speaking evasively'. Choice (1)

**124. Restive:** The crowd became restive when the minister failed to appear even by 10 pm.

- (1) Violent (2) Angry  
(3) Restless (4) Distressed

**Solution:**

Restive : - Unable to keep silent. The word nearest in meaning to the given word is 'restless'

Choice (3)

**125. Ostensible:** Manohar's ostensible job was to guard the building at night.

- (1) Apparent (2) Blatant  
(3) Ostentatious (4) Insidious

**Solution:**

Ostensible means apparently, but not necessarily true. The word nearest in meaning to the given word is "apparent". Choice (1)

The official school dominated the writing of Indian history until we get the first professional historian's approach. Ramsay Muir and P.E. Roberts in England and H.H. Dodwell in India. Then Indian historians trained in the English school joined in, of whom the most distinguished was Sir Jadunath Sarkar and the other notable writers: Surendranath Sen, Dr. Radhakumud Mukerji, and Professor Nilakanta Sastri. They, it may be said, restored India to Indian history, but their bias was mainly political. Finally have come the nationalists who range from those who can find nothing good or true in the British to sophisticated historical philosophers like K.M. Panikker.

Along with types of historians with their varying bias have gone changes in the attitude to the content of Indian history. Here Indian historians have been influenced both by their local situation and by changes of thought elsewhere. It is in this field that this work can claim some attention since it seeks to break new ground, or perhaps to deepen a freshly turned furrow in the field of Indian history. The early official historians were content with the glamour and drama of political history from Plassey to the Mutiny, from Dupleix to the Sikhs. But when the *raj* was settled down, glamour departed from politics, and they turned to the less glorious but more solid ground of administration. Not how India was conquered but how it was governed was the theme of this school of historians. It found its archpriest in H.H. Dodwell, its priestess in Dame Lilian Penson, and its chief shrine in the Volume VI of the *Cambridge History of India*. Meanwhile in Britain other currents were moving, which led historical study into the economic and social fields. R.C. Dutt entered the first of these currents with his *Economic History of India* to be followed more recently by the whole group of Indian economic historians. W.E. Moreland extended these studies to the Mughal Period. Social history is now being increasingly studied and there is also of course a school of nationalist historians who see modern Indian history in terms of the rise and the fulfilment of the national movement.

All these approaches have value, but all share in the quality of being compartmental. It is not enough to remove political history from its pedestal of being the only kind of history worth having if it is merely to put other types of history in its place. Too exclusive an attention to economic, social, or administrative history can be as sterile and misleading as too much concentration on politics. A whole subject needs a whole treatment for understanding. A historian must dissect his subject into its elements and then fuse them together again into an integrated whole. The true history of a country must contain all the features just cited but must present them as parts of a single consistent theme.

- 126.** Which of the following may be the closest in meaning to the statement "restored India to Indian history"?
- Indian historians began writing Indian history.
  - Trained historians began writing Indian history.
  - Writing India-centric Indian history began.
  - Indian history began to be written in India.

**Solution:**

Para 2, lines 3, 4, 5

It means that the Indian historians trained in English school, wrote history from India's point of view.  
Choice (3)

- 127.** Which of the following is the closest implication of the statement "to break new ground, or perhaps to deepen a freshly turned furrow"?
- Dig afresh or dig deeper
  - Start a new stream of thought or help establish a recently emerged perspective
  - Begin or conduct further work on existing archeological sites to unearth new evidence
  - Begin writing a history free of any biases

**Solution:**

Para 3, Lines 2, 3, 4

The statement given in the question means to start a new flow of thought and establish a recently emerged view.  
Choice (2)

- 128.** Historians moved from writing political history to writing administrative history because:
- attitudes of the historians changed.
  - the *raj* was settled down.
  - politics did not retain its past glamour.
  - administrative history was based on solid ground.

**Solution:**

Para 3, lines 5, 6, 7

Choice (3)

- 129.** According to the author, which of the following is **not** among the attitudes of Indian historians of Indian origin?
- Writing history as personal narratives
  - Writing history with political bias
  - Writing non-political history due to lack of glamour
  - Writing history by dissecting elements and integrating them again

**Solution:**

In the last para of the passage, in the 5<sup>th</sup> line, the author says that "A historian must ....."  
i.e. an Indian historian does not have that quality.  
Choice (4)

- 130.** In the table given below, match the historians to the approaches taken by them:

A	Administrative	E	Robert Orme
B	Political	F	H. H. Dodwell
C	Narrative	G	Radha Kumud Mukherji
D	Economic	H	R. C. Dutt

(1)

A	F
B	G
C	E
D	H

(2)

A	G
B	F
C	E
D	H

(3)

A	E
B	F
C	G
D	H

(4)

A	F
B	H
C	E
D	G

**Solution:**

Choice (1) is the answer

Political historians - Para 2

Narrative - Para 1, line 16

Economic - Para 3, line 11

Administrative - Para 3, line 7-10

**T**here are a seemingly endless variety of laws, restrictions, customs and traditions that affect the practice of abortion around the world. Globally, abortion is probably the single most controversial issue in the whole area of women's rights and family matters. It is an issue that inflames women's right groups, religious institutions, and the self-proclaimed "guardians" of public morality. The growing worldwide belief is that the right to control one's fertility is a basic human right. This has resulted in a worldwide trend towards liberalization of abortion laws. Forty percent of the world's population live in countries where induced abortion is permitted on request. An additional 25 percent live in countries where it is allowed if the woman's life would be endangered if she went to full term with her pregnancy. The estimate is that between 26 and 31 million legal abortions were performed in 1987. However, there were also between 10 and 22 million illegal abortions performed in that year.

Feminists have viewed the patriarchal control of women's bodies as one of the prime issues facing the contemporary women's movement. They observe that the definition and control of women's reproductive freedom have always been the province of men. Patriarchal religion, as manifest in Islamic fundamentalism, traditionalist Hindu practice, orthodox Judaism, and Roman Catholicism, has been an important historical contributory factor for this and continues to be an important presence in contemporary societies. In recent times, governments, usually controlled by men, have "given" women the right to contraceptive use and abortion access when their countries were perceived to have an overpopulation problem. When these countries are perceived to be underpopulated, that right has been absent. Until the nineteenth century, a woman's right to an abortion followed English common law; it could only be legally challenged if there was a "quickenning", when the first movements of the foetus could be felt. In 1800, drugs to induce abortions were widely advertised in local newspapers. By 1900, abortion was banned in every state except to save the life of the mother. The change was strongly influenced by the medical profession, which focussed its campaign ostensibly on health and safety issues for pregnant women and the sanctity of life. Its position was also a means of control of nonlicensed medical practitioners such as midwives and women healers who practised abortion.

The anti-abortion campaign was also influenced by political considerations. The large influx of eastern and southern European immigrants with their large families was seen as a threat to the population balance of the future United States. Middle and Upper class Protestants were advocates of abortion as a form of birth control. By supporting abortion prohibitions the hope was that these Americans would have more children and thus prevent the tide of immigrant babies from overwhelming the demographic characteristics of Protestant America.

The anti-abortion legislative position remained in effect in United States through the first sixty-five years of the twentieth century. In the early 1960s even when it was widely known that the drug thalidomide taken during pregnancy to alleviate anxiety was shown to contribute to the formation of deformed "flipper-like" hands or legs of children, abortion was illegal in the United States. A second health tragedy was the severe outbreak of rubella during the same time period, which also resulted in major birth defects. These tragedies combined with a change of attitude towards a woman's right to privacy led a number of states to pass abortion-permitting legislation.

On one side of the controversy are those who call themselves "pro-life". They view the foetus as a human life rather than as an unformed complex of cells; therefore, they hold to the belief that abortion is essentially murder of an unborn child. These groups cite both legal and religious reasons for their opposition to abortion. Pro-lifers point to the rise in legalised abortion figures and see this as morally intolerable. On the other side of the issue are those who call themselves "pro-choice". They believe that women, not legislators or judges, should have the right to decide whether and under what circumstances they will bear children. Pro-choicers are of the opinion that laws will not prevent women from having abortions and cite the horror stories of the past when many women died at the hands of "backroom" abortionists and in desperate attempts to self-abort. They also observe that legalized abortion is especially important for rape victims and incest victims who became pregnant. They stress physical and mental health reasons why women should not have unwanted children.

To get a better understanding of the current abortion controversy, let us examine a very important work by Kristin Luker titled Abortion and the Politics of Motherhood. Luker argues that female pro-choice and pro-life activists hold different world views regarding gender, sex, and the meaning of parenthood. Moral positions on abortions are seen to be tied intimately to views on sexual behaviour, the care of children, family life, technology and the importance of the individual. Luker identifies "pro-choice" women as educated, affluent and liberal. Their contrasting counterparts, "pro-life" women, support traditional concepts of women as wives and mothers. It would be instructive to sketch out the differences in the world views of these two sets of women. Luker examines California, with its liberalized abortion law, as a case history. Public documents and newspaper accounts over a twenty-year period were analysed and over 200 interviews were held with both pro-life and pro-choice activists.

Luker found that pro-life and pro-choice activists have intrinsically different views with respect to gender. Pro-life women have notion of public and private life. The proper place for men is in the public sphere of work; for women, it is the private sphere of the home. Men benefit through the nurturance of women; women benefit through the protection of men. Children are seen to be the ultimate beneficiaries of this arrangement by having the mother as a full-time loving parent and by having clear role models. Pro-choice advocates reject the view of separate spheres. They object to the notion of the home being the "women's sphere". Women's reproductive and family roles are seen as potential barriers to full equality. Motherhood is seen as voluntary, not a mandatory or "natural" role.

In summarizing her findings, Luker believes that women become activists in either of the two movements as the end result of lives that centre around different conceptualisations of motherhood, their beliefs and values are rooted to the concrete circumstances of their lives, their educations incomes, occupations and the different marital and family choices that they have made. They represent two different world views of women's roles in contemporary society and as such the abortion issues represents the battleground for the justification of their respective views.

131. According to your understanding of the author's arguments which countries are more likely to allow abortion?
- (1) India & China
  - (2) Australia & Mongolia
  - (3) Cannot be inferred from the passage
  - (4) Both 1 & 2

**Solution:**

From para 2, line 8 it is clear that abortion is permitted when there is overpopulation. Hence India & China are likely to permit it. Choice (1)

132. Which amongst these was **not** a reason for banning of abortions by 1900?
- (1) Medical professionals stressing the health and safety of women.
  - (2) Influx of Eastern & Southern European immigrants.
  - (3) Control of unlicensed Medical Practitioners.
  - (4) A tradition of Matriarchal control.

**Solution:**

Choice 1 is from para 4, line 7.  
Choice 2 is from para 3, last sentence.  
Choice 3 is from para 5, last 5 line.  
Choice 4 is not mentioned. Hence, answer is choice 4. Choice (4)

133. A pro-life woman would advocate abortion if:
- (1) the mother of an unborn child is suicidal.
  - (2) bearing a child conflicts with a woman's career prospects.
  - (3) the mother becomes pregnant accidentally.
  - (4) None of the above

**Solution:**

Choices 1, 2, 3 are not the characters of a pro-life woman.(refer to para 7) Choice (4)

134. Pro-choice women object to the notion of the home being the "women's sphere" because they believe:
- (1) that the home is a "joint sphere" shared between men and women.
  - (2) that reproduction is a matter of choice for women.
  - (3) that men and women are equal.
  - (4) Both 2 & 3

**Solution:**

Para 7, last 2 lines Choice (4)

135. Two health tragedies affecting U.S. society in the 1960s led to:
- (1) a change in attitude to women's right to privacy.
  - (2) retaining the anti-abortion laws with some exceptions.
  - (3) scrapping of anti-abortion laws.
  - (4) strengthening of the pro-life lobby.

**Solution:**

Para 4 Choice (2)

136. Historically, the Pro-choice movement has got support from, among others:
- (1) major patriarchal religions
  - (2) counties with low population density.
  - (3) medical Profession.
  - (4) none of the above

**Solution:**

None of the these have supported pro-choice movement. Choice (4)

### PASSAGE – 3

The conceptions of life and the world which we call 'philosophical' are a product of two factors: one, inherited religious and ethical conceptions; the other, the sort of investigation which may be called 'scientific', using this word in its broadest sense. Individual philosophers have differed widely in regard to the proportions in which these two factors entered into their systems, but it is the presence of both, in some degree, that characterizes philosophy.

'Philosophy' is a word which has been used in many ways, some wider, some narrower. I propose to use it in a very wide sense, which I will now try to explain.

Philosophy, as I understand the word, is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation. All definite knowledge – so I should contend – belongs to science; all dogma as to what surpasses definite knowledge belongs to theology. But between theology and science there is a 'No man's Land', exposed to attack from both sides; this 'No Man's Land' is philosophy. Almost all the questions of most interest to speculative minds are such as science cannot answer, and the confident answers of theologians no longer seems so convincing as they did in former centuries. Is the world divided into mind and matter, and if so, what is mind? and what is matter? Is mind subject to matter, or is it possessed of independent powers? Has the universe any unity or purpose? Is it evolving towards some goal? Are there really laws of nature, or do we believe in them only because of our innate love of order? Is man what he seems to the astronomer, a tiny lump of carbon and water impotently crawling on a small and unimportant planet? Or is he what he appears to Hamlet? Is he perhaps both at once? Is there a way of living that is noble and another that is base, or are all ways of

living merely futile? If there is a way of living that is noble, in what does it consist, and how shall we achieve it? Must the good be eternal in order to deserve to be valued, or is it worth seeking even if the universe is inexorably moving towards death? Is there such a thing as wisdom, or is what seems such merely the ultimate refinement of folly? To such questions no answer can be found in the laboratory. Theologies have professed to give answers, all too definite; but their definiteness causes modern minds to view them with suspicion. The studying of these questions, if not the answering of them, is the business of philosophy.

Why, then, you may ask, waste time on such insoluble problems? To this one may answer as a historian, or as an individual facing the terror of cosmic loneliness.

The answer of the historian, in so far as I am capable of giving it, will appear in the course of this work. Ever since men became capable of free speculation, their actions in innumerable important respects, have depended upon their theories as to the world and human life, as to what is good and what is evil. This is as true in the present day as at any former time. To understand an age or a nation, we must understand its philosophy, and to understand its philosophy we must ourselves be in some degree philosophers. There is here a reciprocal causation: the circumstances of men's lives do much to determine their philosophy, but, conversely, their philosophy does much to determine their circumstances.

There is also, however, a more personal answer. Science tells us what we can know, but what we can know is little, and if we forget how much we cannot know we may become insensitive to many things of very great importance. Theology, on the other hand, induces a dogmatic belief that we have knowledge, where in fact we have ignorance and by doing so generate a kind of impertinent insolence towards the universe. Uncertainty, in the presence of vivid hopes and fears, is painful, but must be endured if we wish to live without the support of comforting fairy tales. It is not good either to forget the questions that philosophy asks, or to persuade ourselves that we have found indubitable answers to them. To teach how to live without certainty, and yet without being paralysed by hesitation, is perhaps the chief thing that philosophy, in our age, can still do for those who study it.

137. The purpose of philosophy is to:

  - (1) reduce uncertainty and chaos.
  - (2) help us to cope with uncertainty and ambiguity.
  - (3) help us to find explanations for uncertainty.
  - (4) reduce the terror of cosmic loneliness.

### Solution:

Last para, the last two lines. Choice (2)

138. Based on this passage what can be concluded about the relation between philosophy and science?

  - (1) The two are antagonistic.
  - (2) The two are complementary.
  - (3) There is no relation between the two.
  - (4) Philosophy derives from science.

**Solution:**

139. From reading the passage, what can be concluded about the profession of the author?  
He is most likely **not** to be a:  
(1) historian. (2) philosopher.  
(3) scientist. (4) theologian.

**Solution:**

In para 5, he identifies himself with a historian and a philosopher. He is critical of the theology in the last para. The use of the word 'professed' in the last couple of lines of para 3 helps us to decide that he is least likely to be a theologian.

**Choice (4)**

140. According to the author, which of the following statements about the nature of the universe must be definitely true?

  - (1) The universe has unity.
  - (2) The universe has a purpose.
  - (3) The universe is evolving towards a goal.
  - (4) None of the above

**Solution:**

Choices 1, 2, 3 are in para 3, but they are not given as true statements.

**Choice (4)**

## PASSAGE – 4

**C**ells are the ultimate multitaskers: they can switch on genes and carry out their orders, talk to each other, divide in two, and much more, all at the same time. But they couldn't do any of these tricks without a power source to generate movement. The inside of a cell bustles with more traffic than Delhi roads, and, like all vehicles, the cell's moving parts need engines. Physicists and biologists have looked "under the hood" of the cell – and laid out the nuts and bolts of molecular engines.

The ability of such engines to convert chemical energy into motion is the envy of nanotechnology researchers looking for ways to power molecule-sized devices. Medical researchers also want to understand how these engines work. Because these molecules are essential for cell division, scientists hope to shut down the rampant growth of cancer cells by deactivating certain motors. Improving motor-driven transport in nerve cells may also be helpful for treating diseases such as Alzheimer's, Parkinson's or ALS, also known as Lou Gehrig's disease.

We wouldn't make it far in life without motor proteins. Our muscles wouldn't contract. We couldn't grow, because the growth process requires cells to duplicate their machinery and pull the copies apart. And our genes would be silent without the services of messenger RNA, which carries genetic instructions over to the cell's protein-making factories. The movements that make these cellular activities possible occur along a complex network of threadlike fibres, or polymers, along which bundles of molecules travel like trams. The engines that power the cell's freight are three families of proteins, called myosin, kinesin and dynein. For fuel, these proteins burn molecules of ATP, which cells make when they break down the carbohydrates and fats from the foods we eat. The energy from burning ATP causes changes in the proteins' shape that allow them to heave themselves along the polymer track. The results are impressive: In one second, those molecules can travel between 50 and 100 times their own diameter. If a car with a 5-foot-wide engine were as efficient, it would travel 170 to 340 kmph.

Ronald Vale, a researcher at the Howard Hughes Medical Institute and the University of California at San Francisco, and Ronald Milligan of the Scripps Research Institute have realized a long-awaited goal by reconstructing the process by which myosin and kinesin move, almost down to the atom. The dynein motor, on the other hand, is still poorly understood. Myosin molecules, best known for their role in muscle contraction, form chains that lie between filaments of another protein called actin. Each myosin molecule has a tiny head that pokes out from the chain like oars from a canoe. Just as rowers propel their boat by stroking their oars through the water, the myosin molecules stick their heads into the actin and hoist themselves forward along the filament. While myosin moves along in short strokes, its cousin kinesin walks steadily along a different type of filament called a microtubule. Instead of using a projecting head as a lever, kinesin walks on two "legs." Based on these differences, researchers used to think that myosin and kinesin were virtually unrelated. But newly discovered similarities in the motors' ATP-processing machinery now suggest that they share a common ancestor – molecule. At this point, scientists can only speculate as to what type of primitive cell-like structure this ancestor occupied as it learned to burn ATP and use the energy to change shape. "We'll never really know, because we can't dig up the remains of ancient proteins, but that was probably a big evolutionary leap," says Vale.

On a slightly larger scale, loner cells like sperm or infectious bacteria are prime movers that resolutely push their way through to other cells. As L. Mahadevan and Paul Matsudaira of the Massachusetts Institute of Technology explain, the engines in this case are springs or ratchets that are clusters of molecules, rather than single proteins like myosin and kinesin. Researchers don't yet fully understand these engines' fueling process or the details of how they move, but the result is a force to be reckoned with. For example, one such engine is a spring like stalk connecting a single-celled organism called a vorticellid to the leaf fragment it calls home. When exposed to calcium, the spring contracts, yanking the vorticellid down at speeds approaching 3 inches (8 centimeters) per second.

Springs like this are coiled bundles of filaments that expand or contract in response to chemical cues. A wave of positively charged calcium ions, for example, neutralizes the negative charges that keep the filaments extended. Some sperms use spring like engines made of actin filaments to shoot out a barb that penetrates the layers that surround an egg. And certain viruses use a similar apparatus to shoot their DNA into the host's cell. Ratchets are also useful for moving whole cells, including some other sperm and pathogens. These engines are filaments that simply grow at one end, attracting chemical building blocks from nearby. Because the other end is anchored in place, the growing end pushes any barrier that gets in its way.

Both springs and ratchets are made up of small units that each move just slightly, but collectively produce a powerful movement. Ultimately, Mahadevan and Matsudaira hope to better understand just how these particles create an effect that seems to be so much more than the sum of its parts. Might such an understanding provide inspiration for ways to power artificial nano-sized devices in the future? "The short answer is absolutely," says Mahadevan. "Biology has had a lot more time to evolve enormous richness in design for different organisms. Hopefully, studying these structures will not only improve our understanding of the biological world, it will also enable us to copy them, take apart their components and re-create them for other purposes."

- 141.** According to the author, research on the power source of movement in cells can contribute to:
- (1) control over the movement of genes within human systems.
  - (2) the understanding of nanotechnology.
  - (3) arresting the growth of cancer in a human being.
  - (4) the development of cures for a variety of diseases.

**Solution:**

Para 2; lines 3, 4, 5

Choice (4)

- 142.** The author has used several analogies to illustrate his arguments in the article. Which of the following pairs of words are examples of the analogies used?
- a. Cell activity and vehicular traffic.
  - b. Polymers and tram tracks.

- c. Genes and canoes.
  - d. Vorticellids and ratchets.
- |             |             |
|-------------|-------------|
| (1) a and b | (2) b and c |
| (3) a and d | (4) a and c |

**Solution:**

a is from para 1; line 3 and b is from para 3; line 5  
Choice (1)

- 143.** Read the five statements below: a, b, c, d and e. From the options given, select the one which includes a statement that is **not** representative of an argument presented in the passage.
- a. Sperms use spring like engines made of actin filament.
  - b. Myosin and kinesin are unrelated.
  - c. Nanotechnology researchers look for ways to power molecule-sized devices.

- d. Motor proteins help muscle contraction.
  - e. The dynein motor is still poorly understood.

(1) a, b and c      (2) c, d and e  
(3) a, d and e      (4) a, c and d

**Solution:**

Statement 'a' is true. refer to para 6: line 3

Statement 'b' is not true: Refer to para 4, line 8

Statement 'c' is from para 2; line 1

Choice (1) has a statement (b) which is not representative of the argument in the passage.

### Choice (1)

- 144.** Read the four statements below: a, b, c and d. From the options given, select the one which includes only statement(s) that are representative of arguments presented in the passage.

- a. Protein motors help growth processes.
  - b. Improved transport in nerve cells will help arrest tuberculosis and cancer.
  - c. Cells, together, generate more power than the sum of power generated by them separately.
  - d. Vorticellid and the leaf fragment are connected by a calcium engine.

(1) a and b but not c      (2) a and c but not d  
(3) a and d but not b      (4) c and d but not b

**Solution:**

Statement 'a' is from para 3; lines 1, 2, 3. 'C' is from the last para; lines 1-2

Statement 'd' is not true.

### Choice (2)

- 145.** Read the four statements below: a, b, c and d. From the options given, select the one which include statement(s) that are representative of arguments presented in the passage.

- a. Myosin, kinesin and actin are three types of protein.
  - b. Growth processes involve a routine in a cell that duplicates their machinery and pulls the copies apart.
  - c. Myosin molecules can generate vibrations in muscles.
  - d. Ronald and Mahadevan are researchers at Massachusetts Institute of Technology.
    - (1) a and b but not c and d
    - (2) b and c but not a
    - (3) b and d but not a and c
    - (4) a, b and c but not d

### Solution:

Statement a is true : para 3; line 6

Statement b is from para 3; line 2

Statement c is not true : Refer to para 4, line 4

Statement 'd' is not true : Mahadevan is from MIT (para 5, line 2) but not Ronald – he is from Scripps Research Institute (para 4, lines 1-2)

### Choice (1)

PASSAGE – 5

If translated into English, most of the ways economists talk among themselves would sound plausible enough to poets, journalists, businesspeople, and other thoughtful though *noneconomical* folk. Like serious talk anywhere - among boat designers and baseball fans, say - the talk is hard to follow when one has not made a habit of listening to it for a while. The culture of the conversation makes the words arcane. But the people in the unfamiliar conversation are not Martians. Underneath it all (the economist's favorite phrase) conversational habits are similar. Economics uses mathematical models and statistical tests and market arguments, all of which look alien to the literary eye. But looked at closely they are not so alien. They may be seen as figures of speech - metaphors, analogies and appeals to authority.

Figures of speech are not mere frills. They think for us. Someone who thinks of a market as an "invisible hand" and the organization of work as a "production function" and his coefficients as being "significant," as an economist does, is giving the language a lot of responsibility. It seems a good idea to look hard at his language.

If the economic conversation were found to depend a lot on its verbal forms, this would not mean that economics would be not a science, or just a matter of opinion, or some sort of confidence game. Good poets, though not scientists, are serious thinkers about symbols; good historians, though not scientists, are serious thinkers about data. Good scientists also use language. What is more (though it remains to be shown) they use the cunning of language, without particularly meaning to. The language used is a social object, and using language is a social act. It requires cunning (or, if you prefer, consideration), attention to the other minds present when one speaks.

The paying of attention to one's audience is called "rhetoric," a word that I later exercise hard. One uses rhetoric, of course, to warn of a fire in a theatre or to arouse the xenophobia of the electorate. This sort of yelling is the vulgar meaning of the word, like the president's "heated rhetoric" in a press conference or the "mere rhetoric" to which our enemies stoop. Since the Greek flame was lit, though, the word has been used also in a broader and more amiable sense, to mean the study of all the ways of accomplishing things with language: inciting a mob to lynch the accused, to be sure, but also persuading readers of a novel that its characters breathe, or bringing scholars to accept the better argument and reject the worse.

The question is whether the scholar – who usually fancies himself an announcer of “results” or a stater of “conclusions” free of rhetoric – speaks rhetorically. Does he try to persuade? It would seem so. Language, I just said, is not a solitary accomplishment. The scholar doesn’t speak into the void, or to himself. He speaks to a community of voices. He desires to be heeded, praised, published, imitated, honoured, ennobled. These are the desires. The devices of language are the means.

Rhetoric is the proportioning of means to desires in speech. Rhetoric is an economics of language, the study of how scarce means are allocated to the insatiable desires of people to be heard. It seems on the face of it a reasonable hypothesis that economists are like other people in being talkers, who desire listeners when they go to the library or the laboratory as much as when they go to the office on the polls. The purpose here is to see if this is true, and to see if it is useful: to study the rhetoric of economic scholarship.

The subject is scholarship. It is not the economy, or the adequacy of economic theory as a description of the economy, or even mainly the economist's role in the economy. The subject is the conversation economists have among themselves, for purposes of persuading each other that the interest elasticity of demand for investment is zero or that the money supply is controlled by the Federal Reserve.

Unfortunately, though, the conclusions are of more than academic interest. The conversations of classicists or of astronomers rarely affect the lives of other people. Those of economists do so on a large scale. A well known joke describes a May Day parade through Red Square with the usual mass of soldiers, guided missiles, rocket launchers. At last come rank upon rank of people in gray business suits. A bystander asks, "Who are those?" "Aha!" comes the reply, "those are economists: you have no idea what damage they can do!" Their conversations do it.



**Solution:**

Statement 'a' is backed by para 2.

Statement 'c' is backed by the concluding lines and the first two lines of para 1.

Choice (3)

147. In the light of the definition of rhetoric given in the passage, which of the following will have the least element of rhetoric?

  - An election speech
  - An advertisement jingle.
  - Dialogues in a play.
  - Commands given by army officers.

**Solution:**

In para 4 line 1, we find the definition of the word "rhetoric" from which we can conclude choice (4) is the right answer. Choice (4)

148. As used in the passage, which of the following is closest in meaning to the statement "The culture of the conversation makes the words arcane"?  
(1) Economists belong to a different culture.  
(2) Only mathematicians can understand economists.

- (3) Economists tend to use terms unfamiliar to the lay person, but depend on familiar linguistic forms.
  - (4) Economists use similes and adjectives in their analysis.

### Solution:

The meaning of the word *arcane* is (understood only by a few). From para 1; line 4, to 7 we can conclude that choice (3) is the appropriate answer.

**Choice (3)**

- 149.** As used in the passage, which of the following is the closest alternative to the word 'arcane'?  
(1) Mysterious      (2) Secret  
(3) Convert           (4) Perfidious

**Solution:**

Arcane : Mysterious (para1, line 5)

Choice (1)

150. Based on your understanding of the passage, which of the following conclusions would you agree with?

  - (1) The geocentric and the heliocentric views of the solar system are equally tenable.
  - (2) The heliocentric view is superior because of better rhetoric.
  - (3) Both views use rhetoric to persuade.
  - (4) Scientists should not use rhetoric.

**Solution:**

The answer is from para 3, lines 4, 5, 6.

Choice (3)

