

# Unproctored Mock-6 2014

## Section – I

1. There are two signals which keep changing their colours continuously according to a pattern. The first signal  $S_1$  remains Red for 5 seconds, then turns Green for the next 7 seconds, then turns Blue for the next 6 seconds, then Red again for 5 seconds and so on. The second signal  $S_2$  remains Red for 7 seconds, then turns Green for the next 11 seconds, then turns Blue for the next 6 seconds, then Red again for 7 seconds and so on. If  $S_1$  and  $S_2$  turn Red simultaneously, then after how much time (in seconds) will they turn Blue simultaneously for the first time?

(a) 140                          (b) 66                          (c) 72                          (d) 78

1. b One cycle of  $S_1$  takes 18 seconds and that of  $S_2$  takes 24 seconds. Therefore, the two signals turn Red simultaneously after every 72 seconds (L.C.M of 18 and 24). Also, exactly 6 seconds before they turn Red, they would have turned Blue simultaneously. Hence, the two signals will turn Blue simultaneously for the first time exactly 66 seconds after the start.

2. The roots of  $x^3 - ax^2 + bx - c = 0$  are p, q and r while the roots of  $x^3 + dx^2 + ex - 90 = 0$  are p + 3, q + 3 and r + 3. What is the value of 9a + 3b + c?
- (a) 27                                  (b) 90                                  (c) 45                                  (d) 63

2. d  $p + q + r = a$ ,  $pq + qr + pr = b$  and  $pqr = c$  ... (i)

Also,  $(p + 3) \times (q + 3) \times (r + 3) = 90$   
 $\Rightarrow pqr + 3(pq + qr + pr) + 9(p + q + r) + 27 = 90$  ... (ii)

From equations (i) and (ii), we get,  
 $9a + 3b + c = 63$

3. One man and six women working together can do a job in 10 days. The same job is done by two men in 'p' days and by eight women in p+5 days. By what percentage is the efficiency of a man greater than that of a woman?
- (a) 300%                                  (b) 500%                                  (c) 600%                                  (d) 700%

3. b Let the work (in units) done by a man and a woman in one day be M and W respectively.  
Total work (in units) =  $10(M + 6W) = 10M + 60W$

$$\Rightarrow \frac{10M + 60W}{8W} - \frac{10M + 60W}{2M} = 5$$

$$\frac{5M}{4W} - \frac{30W}{M} = \frac{5}{2}$$

On putting  $\frac{M}{W} = x$ , we get  $\frac{5x}{4} - \frac{30}{x} = \frac{5}{2}$

On solving we get  $x = 6$  i.e.  $\frac{M}{W} = 6$ .

Therefore, the efficiency of a man is greater than that of a woman by 500%.

**Note:** The question can also be solved by checking the options.

4. Two cards are drawn randomly from a deck of 52 playing cards. What is the probability that both of them are face cards but of different suits?

(a)  $\frac{9}{221}$

(b)  $\frac{18}{221}$

(c)  $\frac{9}{663}$

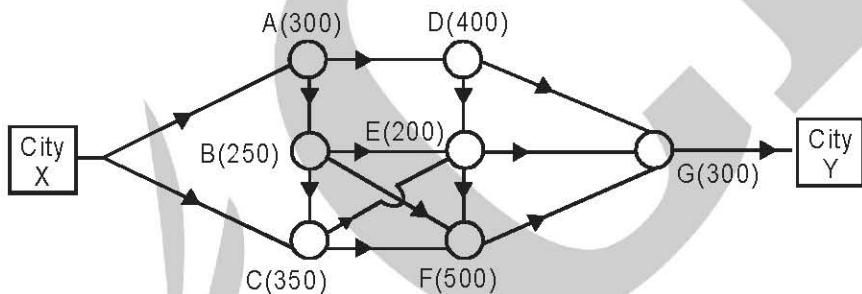
(d)  $\frac{12}{663}$

4. a The total number of ways in which 2 cards can be selected from 52 playing cards =  ${}^{52}C_2$ .  
 There are 4 suits and each suit has 3 face cards (Jack, Queen and King).  
 Two different suits can be selected out of the four in  ${}^4C_2$  ways.  
 From each of the two suits selected, a face card can be selected in  ${}^3C_1 = 3$  ways.  
 Hence, the total number of ways of selecting two face cards of different suits =  ${}^4C_2 \times 3 \times 3$ .

$$\text{Required Probability} = \frac{{}^4C_2 \times 9}{{}^{52}C_2} = \frac{9}{221}.$$

**Directions for questions 5 to 7:** Answer the questions on the basis of the information given below.

In the figure given below, all the routes of going from City X to City Y are shown by the help of arrows. Each route passes through some of the seven Refugee Camps called A, B, C, D, E, F and G. The number given in brackets along with the name of a Refugee Camp represents the number of people staying in that camp.



It is also known that:

- A truck is loaded with food supply at City X. It takes one of the possible routes to City Y and distributes food packets among the people staying in all the camps along its route.
  - Each person staying in a camp is given a food packet weighing 1.5 kg. A truck is allowed to pass through a camp on its route only after each person staying in the camp gets the food packet.
5. How many different routes can a truck loaded with 2100 kg of food supply take from City X to City Y such that it can give food packets to all the people staying in camps along that route?  
 (a) 4    (b) 6    (c) 10    (d) 8
6. A truck loaded with 2100 kg of food supply is barely able to give food packets to all the people staying in camps along its route and is left with no food when it reaches City Y. How many camps fall in the route taken by the truck?  
 (a) 5   (b) 4   (c) 3    (d) Cannot be determined
7. A pair of two routes on which the quantity of food that needs to be distributed by a truck is exactly the same is called an "F-pair". How many F-pairs are there among the different routes from City X to City Y?  
 (a) 0   (b) 1   (c) 2    (d) 3

**For questions 5 to 7:**

The table given below lists all the possible routes, the number of camps covered in a route and the total number of people staying across all the camps covered in a route.

S. No.	Route	The number of camps covered	The total number of people
1	X-A-D-G-Y	3	1000
2	X-A-D-E-G-Y	4	1200
3	X-A-D-E-F-G-Y	5	1700
4	X-A-B-E-G-Y	4	1050
5	X-A-B-E-F-G-Y	5	1550
6	X-A-B-F-G-Y	4	1350
7	X-A-B-C-E-G-Y	5	1400
8	X-A-B-C-E-F-G-Y	6	1900
9	X-A-B-C-F-G-Y	5	1700
10	X-C-E-G-Y	3	850
11	X-C-E-F-G-Y	4	1350
12	X-C-F-G-Y	3	1150

5. d As the truck contains 2100 kg of food supply and everybody is given a food packet of 1.5 kg, the truck can deliver food to at most  $\frac{2100}{1.5} = 1400$  people in a trip. There are eight routes on which the total number of people are either less than or equal to 1400.
6. a The only route along which exactly 1400 people stay in the camps is X-A-B-C-E-G-Y. The number of camps covered is 5.
7. c The two F-pairs are:  
 (i) 1350 people – X-C-E-F-G-Y and X-A-B-F-G-Y  
 (ii) 1700 people – X-A-D-E-F-G-Y and X-A-B-C-F-G-Y
8. The ratio of the present ages of Bini and Coral is the same as the ratio of the ages of Anu and Bini six years ago. Coral, six years from now, will be as old as Anu was six years ago. If the present ages (in years) of exactly two of them are perfect squares, then which of the following can be the sum of the present ages of the three?  
 (a) 27 years      (b) **30 years**      (c) 36 years      (d) 48 years

8. b Let the present ages (in years) of Anu, Bini and Coral be  $x$ ,  $y$  and  $z$  respectively.

$$\frac{y}{z} = \frac{x-6}{y-6} \quad \dots(i)$$

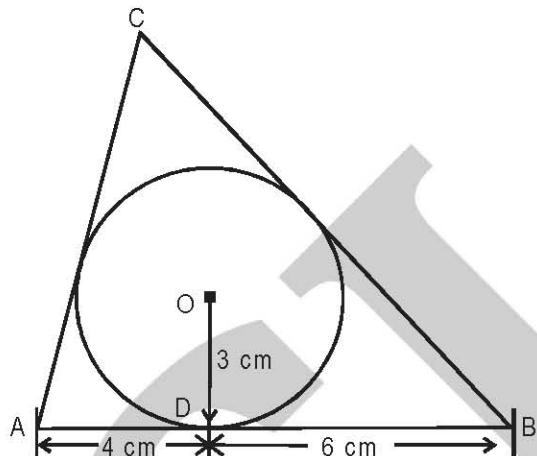
$$\text{Also, } z+6 = x-6 \Rightarrow x = z+12$$

Substituting the value of 'x' in equation (i), we get

$$\frac{y}{z} = \frac{z+6}{y-6} \Rightarrow y^2 - 6y = z^2 + 6z \Rightarrow y = z + 6$$

Therefore, the present ages (in years) of Anu, Bini and Coral are  $z+12$ ,  $z+6$  and  $z$  respectively. The only possible solution is  $z = 4$  and the required sum is 30 years.

9. The figure given below shows a triangle ABC that circumscribes a circle of radius 3 cm. D is the point of contact of the circle with the side AB. AD = 4 cm and BD = 6 cm. What is the ratio of AC to BC?



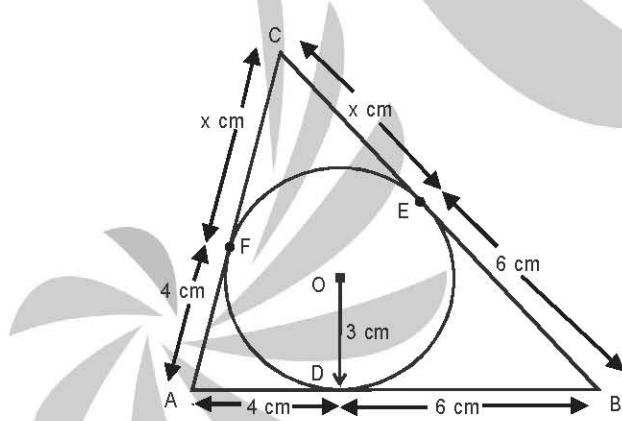
(a) 5 : 6

(b) 9 : 11

(c) 11 : 13

(d) 4 : 5

9. a The lengths of the tangents drawn from the same point to a circle are equal. Using this property the figure can be redrawn as:



$$\text{Inradius of triangle } r = \frac{\text{Area}}{\text{Semiperimeter}}$$

Using Hero's formula for the area of triangle ABC,

$$r = 3 = \frac{\sqrt{s(s-a)(s-b)(s-c)}}{s}, \text{ where } a = 6 + x, b = 4 + x, c = 10 \text{ and } s = \frac{a+b+c}{2} = 10 + x.$$

$$\text{Thus, } r = 3 = \frac{\sqrt{(10+x)(4)(6)(x)}}{10+x} = \sqrt{\frac{24x}{(10+x)}}$$

Solving the above equation, we get  $x = 6$ .

Hence,  $AC = 10$  cm and  $BC = 12$  cm.

Required ratio = 5 : 6

10. Find the number of positive integer solutions of the equation  $\frac{2}{x} + \frac{15}{y} = 5$ .
- (a) 0      (b) 1      (c) 2      (d) 3

10. b We have  $\frac{2}{x} + \frac{15}{y} = 5$

$$\Rightarrow 2y + 15x = 5xy$$

$$\Rightarrow 5xy - 2y - 15x = 0$$

$$\Rightarrow (y - 3)(5x - 2) = 6$$

Now, 6 can be written as  $2 \times 3, -2 \times -3, 1 \times 6$

or  $-1 \times -6$ .

The only possible case is  $5x - 2 = 3$  and  $y - 3 = 2$ .

Therefore,  $x = 1$  and  $y = 5$ .

11. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

**Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.**

Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.

Mark (c) if the question can be answered by using either statement alone.

Mark (d) if the question cannot be answered by any of the two statements.

**Q.** The cost of 2 Apples, 3 Bananas and 1 Mango is Rs. 24. The cost of 2 Bananas and 4 Apples is equal to the cost of 3 Mangoes. What is the cost of one Mango?

**A.** The cost of 2 Bananas and 1 Mango is Rs. 12.

**B.** The cost of 4 Bananas and 5 Mangoes is Rs. 48.

11. a Let the cost (in Rs.) of 1 Apple, 1 Banana and 1 Mango be A, B and M respectively.

According to the information given in the question:

$$2A + 3B + M = 24 \quad \dots (i)$$

$$2B + 4A = 3M \quad \dots (ii)$$

From 2(i) – (ii):

$$4B + 5M = 48 \quad \dots (iii)$$

**From Statement A:**

$$2B + M = 12$$

Solving the above equation with (iii), we get  $M = 8$ .

Hence, Statement A alone is sufficient to answer the question.

**From Statement B:**

$$4B + 5M = 48$$

The above equation is the same as (iii) and hence is redundant.

Hence, Statement B alone is insufficient to answer the question.

12. Find the value of S if  $S = \frac{5}{2} + \frac{13}{6} + \frac{25}{12} + \frac{41}{20} + \dots$   $\frac{4901}{2450}$
- (a) 99      (b)  $\frac{4969}{50}$       (c)  $\frac{4949}{50}$       (d) None of these

$$12. c \quad S = 2 + \frac{1}{2} + 2 + \frac{1}{6} + 2 + \frac{1}{12} + \dots + 2 + \frac{1}{2450}$$

$$S = 2 \times 49 + \frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \dots - \frac{1}{49 \times 50}$$

$$S = 98 + 1 - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \dots - \frac{1}{49} + \frac{1}{50}$$

$$S = 98 + 1 - \frac{1}{50} = \frac{4949}{50}.$$

13. If  $\alpha$  and  $\beta$  are the roots of the equation  $7x^2 - 6x + 1 = 0$ , then what is the value of  $\alpha + \beta + \alpha^2 + \beta^2 + \alpha^3 + \beta^3 + \alpha^4 + \beta^4 + \dots$  till infinity?
- (a) 1      (b) 2      (c) 4      (d) None of these

13. b From the equation  $7x^2 - 6x + 1 = 0$ , we can deduce that  $\alpha + \beta = \frac{6}{7}$  and  $\alpha\beta = \frac{1}{7}$ .

It is clear from the above that  $0 < \alpha, \beta < 1$ .

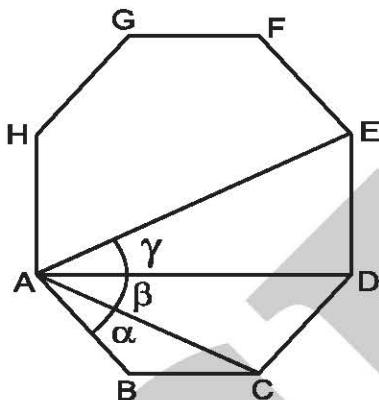
Let  $S = \alpha + \beta + \alpha^2 + \beta^2 + \alpha^3 + \beta^3 + \alpha^4 + \beta^4 + \dots$  till infinity

$$\Rightarrow S = \{\alpha + \alpha^2 + \alpha^3 + \alpha^4 + \dots\} + \{\beta + \beta^2 + \beta^3 + \beta^4 + \dots\}$$

$$\Rightarrow S = \frac{\alpha}{1-\alpha} + \frac{\beta}{1-\beta} \quad (\text{As } 0 < \alpha, \beta < 1)$$

$$\Rightarrow \frac{\alpha}{1-\alpha} + \frac{\beta}{1-\beta} = \frac{(\alpha+\beta)-2\alpha\beta}{1-(\alpha+\beta)+\alpha\beta} = \frac{\frac{6}{7}-\frac{2}{7}}{1-\frac{6}{7}+\frac{1}{7}} = \frac{\frac{4}{7}}{\frac{2}{7}} = 2$$

14. The figure given below shows a regular octagon ABCDEFGH. The measure (in degrees) of  $\angle BAC$ ,  $\angle CAD$  and  $\angle DAE$  are  $\alpha$ ,  $\beta$  and  $\gamma$  respectively. What is the ratio  $\alpha : \beta : \gamma$ ?



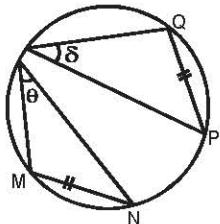
(a) 1 : 1 : 1

(c) 2 : 1 : 3

(d) 1 : 2 : 3

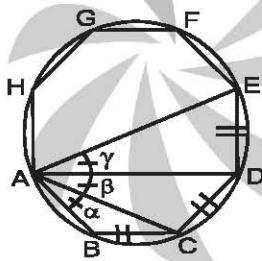
(b) None of these

14. a **Note:** If two chords of a circle are of equal lengths, then the major arcs formed by them are of the same measure and so are the minor arcs. For example, in the figure given below,  $MN = PQ$ .



Hence, we can conclude that  $\theta = \delta$ .

Any regular polygon is cyclic and hence a regular octagon is a cyclic octagon. The figure given in the question can be redrawn as:



Hence,  $\alpha = \beta = \gamma$  and  $\alpha : \beta : \gamma = 1 : 1 : 1$ .

**Directions for questions 15 and 16:** Answer the questions on the basis of the information given below.

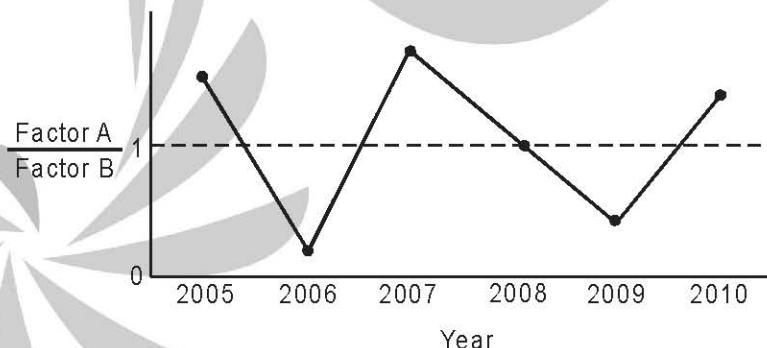
In a consulting firm, apart from the "Fixed Annual Income", there is a "Variable component" which affects an employee's "Total Annual Salary". The Variable component is the difference of two factors called A and B. The "Average Salary (Per Deal)" of an employee is calculated by dividing the Total Annual Salary by the number of deals made by the employee in a year. To summarise,

- (i) Total Annual Salary = Fixed Annual Income + Variable component
- (ii) Variable component = Factor A – Factor B
- (iii) Average Salary (Per Deal) =  $\frac{\text{Total Annual Salary}}{\text{Number of Deals}}$

The table given below shows the Fixed Annual Income and the Average Salary (Per Deal) of an employee for each year from 2005 to 2010. It is known that  $I_1 < I_4 < I_2 < I_3 < I_5$ .

Year	Fixed Annual Income (In Rs.)	Average Salary (Per Deal) (In Rs.)
2005	$I_1$	$A_1$
2006	$I_2$	$A_2$
2007	$I_3$	$A_2$
2008	$I_3$	$A_3$
2009	$I_4$	$A_4$
2010	$I_5$	$A_5$

The line graph given below shows the ratio of Factor A to Factor B for the employee for each year from 2005 to 2010.



- 15. If  $A_2 < A_1 < A_3 < A_4 < A_5$ , then how many years are there for which it can be conclusively determined that the number of deals made by the employee in that year was definitely less than that in 2007?  
(a) 1    (b) 2    (c) 3    (d) 4
- 16. The number of deals made by the employee increased in each year as compared to the previous year in the period 2006–2010. In which of the following pairs of years can the Average Salary (Per Deal) of the employee not be equal?  
(a) 2005 and 2006                              (b) 2006 and 2007                                    (c) 2007 and 2010                                     (d) **2008 and 2009**

**For questions 15 and 16:**

If the ratio of Factor A to Factor B is greater than 1, then 'Factor A – Factor B' is positive.

If the ratio of Factor A to Factor B is less than 1, then 'Factor A – Factor B' is negative.

If the ratio of Factor A to Factor B is equal to 1, then 'Factor A – Factor B' is 0.

15. c The following table provides the required information.

Year	2005	2006	2007	2008	2009	2010
Number of Deals	$\frac{I_1 + (+ve)}{A_1}$	$\frac{I_2 + (-ve)}{A_2}$	$\frac{I_3 + (+ve)}{A_2}$	$\frac{I_3}{A_3}$	$\frac{I_4 + (-ve)}{A_4}$	$\frac{I_5 + (+ve)}{A_5}$

$$I_1 < I_4 < I_2 < I_3 < I_5 \text{ and } A_2 < A_1 < A_3 < A_4 < A_5$$

Combining the data in the table and the relations given above, we can say that in each of the years 2006, 2008 and 2009 the number of deals made by the employee was definitely less than that in 2007.

16. d Let the number of deals made by the employee in each year from 2005 to 2010 be  $D_1, D_2, D_3, D_4, D_5$  and  $D_6$  respectively. It is given that  $D_1 < D_2 < D_3 < D_4 < D_5 < D_6$ .

The following table provides the required information.

Year	2005	2006	2007	2008	2009	2010
Average Salary Per Deal (in Rs.)	$\frac{I_1 + (+ve)}{D_1}$	$\frac{I_2 + (-ve)}{D_2}$	$\frac{I_3 + (+ve)}{D_3}$	$\frac{I_3}{D_4}$	$\frac{I_4 + (-ve)}{D_5}$	$\frac{I_5 + (+ve)}{D_6}$

Combining the data in the table and the given relation, we can conclude that the Average Salary (Per Deal) cannot be equal for 2008 and 2009.

17. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:

Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.

Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.

Mark (c) if the question can be answered by using either statement alone.

**Mark (d) if the question cannot be answered by any of the two statements.**

**Q.** The H.C.F. of two numbers is 64. If one of the numbers is 320, then what is the number of prime factors of the other number?

**A.** The L.C.M. of the two numbers is 1120.

**B.** The other number is divisible by 7.

17. d **From Statement A:**

Statement A is useless as it is not consistent with the data given in the question. The given L.C.M. 1120 is not a multiple of the H.C.F. 320.

**From Statement B:**

Statement B alone is clearly insufficient.

Hence, the question cannot be answered by any of the two statements.

18. Three varieties of rice with Cost Price (in Rs./kg) 28, 36 and 45 are mixed in the ratio  $a : b : c$  respectively. It is known that  $a, b$  and  $c$  are in Geometric Progression where  $a < b < c$ . The Cost Price (in Rs./kg) of the mixture becomes 40. What would have been the Cost Price (in Rs./kg) of the mixture had the three varieties been mixed in the ratio  $c : a : b$ ?

(a) 24

(b) 28

**(c) 34**

(d) 38

18. c  $28a + 36b + 45c = 40(a + b + c)$

$\Rightarrow 12a + 4b = 5c$

Let the quantities (in kg) of the three varieties of rice be  $x, xr$  and  $xr^2$  respectively, where  $r$  is the common ratio.

$\therefore 12x + 4xr = 5xr^2$

$\Rightarrow 5r^2 - 4r - 12 = 0$

$\Rightarrow (5r + 6)(r - 2) = 0$

$\Rightarrow r = 2$

Therefore,  $a : b : c = 1 : 2 : 4$ .

Required C.P. (in Rs./kg) =  $\frac{28 \times 4 + 36 + 45 \times 2}{7} = 34$ .

19.  $N = 7777\ldots\ldots\ldots 7777$ , where the digit 7 repeats itself 429 times. What is the remainder left when  $N$  is divided by 1144?

(a) 913

(b) 1129

**(c) 777**

(d) None of these

19. c A natural number formed by using the same digit written 6 times (eg. 777777) is always divisible by 1001 i.e.  $7 \times 11 \times 13$ . (Since,  $1001 \times 111 = 111111$ )

Also,  $N$  can be written as:

$7777\ldots\ldots\ldots 7777 \times 1000 + 777$

$\xleftarrow{\text{426 times}} \quad \xrightarrow{\text{426 times}}$

$\therefore 7777\ldots\ldots\ldots 7777 \times 1000$  is always divisible

$\xleftarrow{\text{426 times}} \quad \xrightarrow{\text{426 times}}$

by 1144 i.e.  $11 \times 13 \times 8$ .

Required remainder = 777

20. Ajit and Baba are standing at a distance of 120 m from each other. Ajit starts running towards Baba and at the same time Baba starts running away from Ajit. As soon as Ajit catches Baba, Ajit turns back and start running backwards. By the time Ajit reaches the point from where Baba started, Baba has covered a total distance of 120 m. What is the total distance (in metres) that has been covered by Ajit at this point?

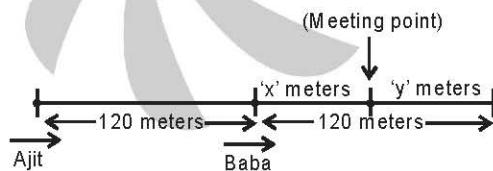
**(a)  $120(\sqrt{2} + 1)$**

(b)  $60(\sqrt{2} + 2)$

(c)  $60(2\sqrt{2} + 1)$

(d)  $60(\sqrt{2} + 1)$

20. a



Let the speeds (in m/s) of Ajit and Baba be ' $a$ ' and ' $b$ ' respectively.

Let the distance (in metres) covered by Ajit and Baba till the time they meet be  $(120 + x)$  and ' $x$ ' respectively.

$$\therefore \frac{a}{b} = \frac{120+x}{x}$$

... (i)

(In the same time, ratio of the distance covered is the same as the ratio of the speeds.)

Let the distance (in metres) covered by Baba by the time Ajit reaches Baba's starting point be 'y' metres.

$$\therefore \frac{a}{b} = \frac{x}{y} \quad \dots \text{(ii)}$$

$$\text{Also, } x + y = 120 \Rightarrow y = 120 - x \quad \dots \text{(iii)}$$

From equations (i), (ii) and (iii), we get

$$\frac{120+x}{x} = \frac{x}{120-x} \Rightarrow 2x^2 = 120^2 \Rightarrow x = 60\sqrt{2}$$

The total distance covered by Ajit =  $120 + 2x = 120(\sqrt{2} + 1)$  m.

21. A regular pentagon is drawn on a piece of paper. In how many ways can five identical Re.1 coins be placed on the five vertices of the pentagon if exactly one coin is to be placed on each vertex?

(a) 6

(b) 32

(c) 16

**(d) 8**

21. d Though the coins are identical, each of them can show either Head (H) or Tail (T).

**Case I:** 5 H and 0 T

The number of ways = 1

**Case II:** 4 H and 1 T

The number of ways = 1

**Case III:** 3 H and 2 T

When the 2 Ts are together, the number of ways = 1

When the 2 Ts are not together, the number of ways = 1

**Case IV:** 2 H and 3 T

When the 2 Hs are together, the number of ways = 1

When the 2 Hs are not together, the number of ways = 1

**Case V:** 1 H and 4 T

The number of ways = 1

**Case VI:** 0 H and 5 T

The number of ways = 1

The total number of ways = 8

22. A function  $f(x)$  is defined for all real values of  $x$  as  $\text{Min}(-x^2, x - 20, -x - 20)$ . What is the maximum value of  $f(x)$ ?

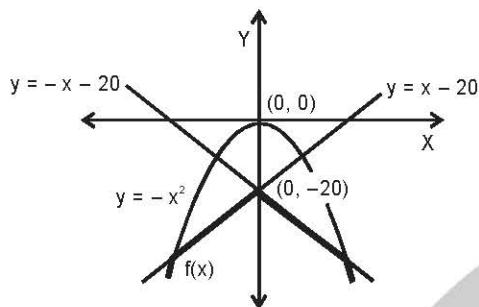
(a) -16

**(b) -20**

(c) -25

(d) None of these

22. b The lines  $y = x - 20$  and  $y = -x - 20$  intersect at  $(0, -20)$  which lies inside the downward curve  $y = -x^2$ . The three curves are plotted as given below and the highlighted part shows  $f(x)$ .



From the above graph it can be observed that the maximum value of  $f(x)$  is -20.

**Note:** Solving the given three equations for critical points can also be used to do the question but that approach may consume more time.

23. If a positive integer 'n' is subtracted from the squares of three consecutive terms of an Arithmetic Progression, the numbers obtained are 120, 232 and 376 respectively. What is the sum of the digits of 'n'?

(a) 3

(b) 5

**(c) 6**

(d) 10

23. c Let the three terms in A.P. be  $a - d$ ,  $a$  and  $a + d$ , where 'd' is the common difference.

$$120 + n = (a - d)^2 \quad \dots (i)$$

$$232 + n = a^2 \quad \dots (ii)$$

$$376 + n = (a + d)^2 \quad \dots (iii)$$

Subtracting equation (i) from (ii) and equation (ii) from (iii), we get

$$2ad - d^2 = 112$$

$$2ad + d^2 = 144$$

$$\therefore d = 4 \text{ and } a = 16$$

Therefore, from equation (i), we get

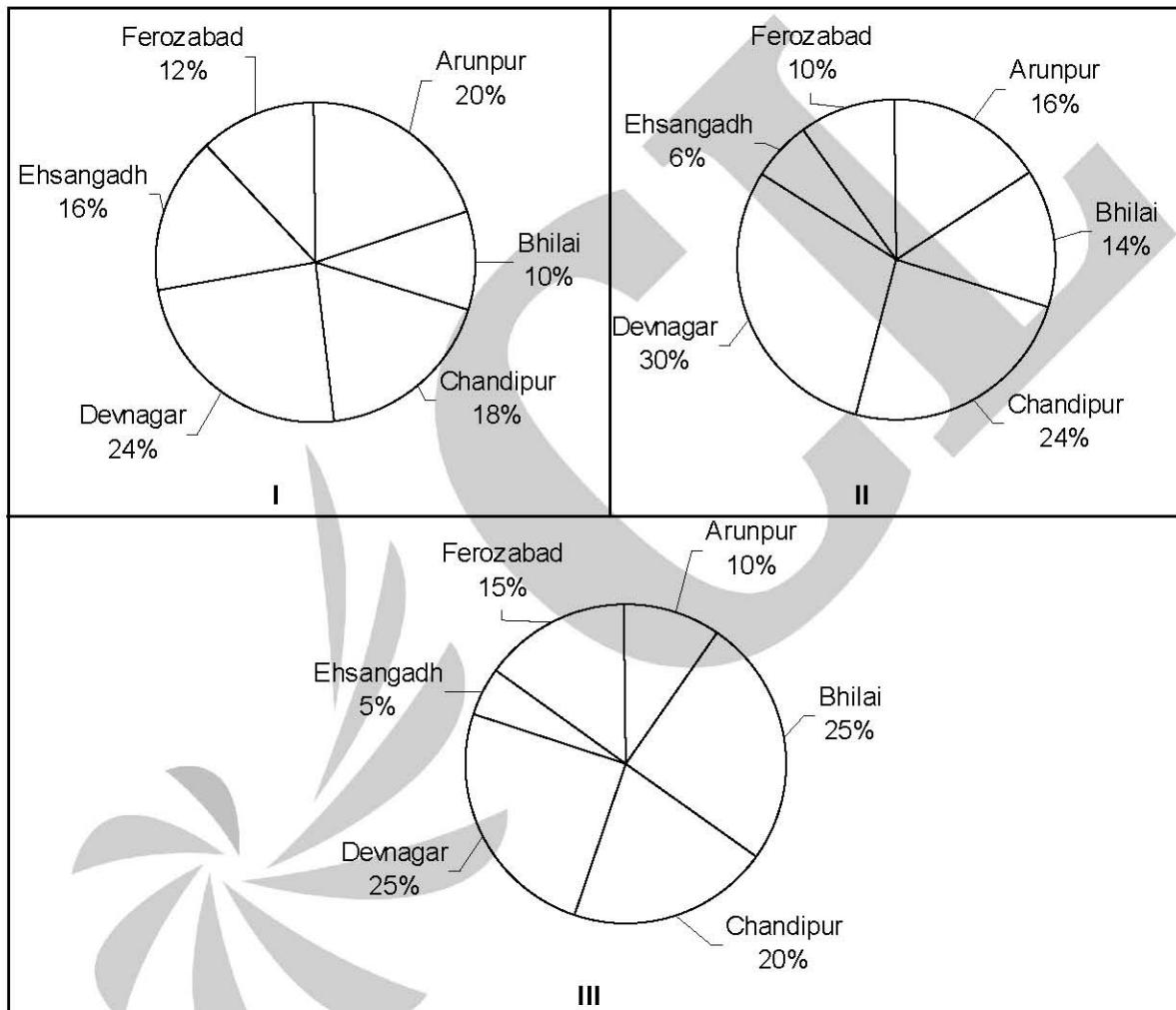
$$120 + n = 12^2 \Rightarrow n = 24$$

$$\text{Required sum} = 2 + 4 = 6$$

**Directions for questions 24 to 26:** Answer the questions on the basis of the information given below.

A company called New Ideas Pvt. Ltd. has exactly one branch in each of the six cities – Arunpur, Bhilai, Chandipur, Devnagar, Ehsangadh and Ferozabad. The company operates in these six cities only. Each branch generates some revenue for the company and incurs some cost on its operations.

**Pie chart I** shows the percentage contribution of each branch in the total revenue generated by the company in the year 2010. **Pie chart II** shows the percentage contribution of each branch in the total cost incurred by the company in the year 2010. **Pie chart III** shows the percentage break-up of the total number of employees working in the company in the year 2010. Every employee works in just one of the branches.



**Please Note:**

- Profit/Loss made by a branch = Revenue generated by the branch – Cost incurred by the branch
- Profit/Loss per employee of a branch =  $\frac{\text{Profit/Loss made by the branch}}{\text{The number of employees in the branch}}$
- Profit/Loss percentage =  $\frac{\text{Revenue Generated} - \text{Cost Incurred}}{\text{Cost Incurred}} \times 100\%$

24. If Ferozabad branch suffered a loss in 2010, then which of the following branches may have made a profit in 2010?  
 (a) Arunpur                          (b) Bhilai                                  (c) Chandipur                          (d) Devnagar
25. If Profit/Loss per employee for Arunpur and Bhilai were the same in 2010, then how many branches made a profit in 2010?  
 (a) 4                                      (b) 3    (c) 2    (d) 1
26. If none of the six branches suffered a loss in 2010, then the profit percentage of New Ideas Pvt. Ltd. must have been at least  
 (a) 25%                                (b) 33.33%                                (c) 40%                                    (d) 50%

**For questions 24 to 26:**

Let the total revenue generated by the company, the total cost incurred by the company and the total number of employees working in the company in the year 2010 be  $100x$ ,  $100y$  and  $100z$  respectively.

24. a If a branch makes a profit then the ratio of revenue to cost will be more than 1 and if a branch suffers a loss then the ratio of revenue to cost will be less than 1.

As Ferozabad branch made a loss in 2010,

$$\frac{12x}{10y} < 1 \Rightarrow \frac{x}{y} < \frac{5}{6}$$

Let the ratio of revenue to cost for Arunpur branch be 'k'.

$$\therefore \frac{20x}{16y} = k \Rightarrow \frac{x}{y} = \frac{4}{5}k$$

$$\frac{x}{y} < \frac{5}{6} \Rightarrow \frac{4}{5}k < \frac{5}{6} \text{ and } k < \frac{25}{24}.$$

Thus, 'k' may be greater than 1.

Similarly, the only other branch which may have made a profit in 2010 is Ehsangadh branch.

25. d It is given that

$$\frac{20x - 16y}{10z} = \frac{10x - 14y}{25z}$$

$$\Rightarrow 80x = 52y \Rightarrow x : y = 13 : 20$$

The only branch which made profit in 2010 was Ehsangadh branch.

26. c We need to find the minimum possible ratio of the total revenue generated to the total cost incurred by the company such that none of the six branches suffers a loss.

For Bhilai branch, the ratio of revenue to cost is the least i.e.  $\frac{5x}{7y}$  among the six branches. For Bhilai to have a no-profit-

no-loss situation,  $\frac{x}{y} = \frac{7}{5}$ . Therefore, the profit percentage of the company must have been at least 40%.

27. A boy of height 100 cm starts walking along a straight line away from the base of a lamppost at a speed of 1.4 m/s. If the lamp is 42 m above the ground, find the length (in cm) of the boy's shadow after 40 seconds.

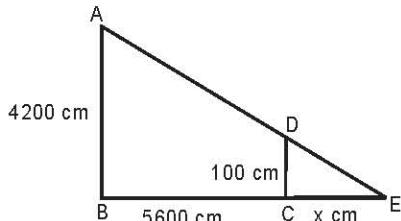
(a) 122.6

**(b) 136.6**

(c) 143.8

(d) 145.6

27. b The distance covered by the boy in 40 seconds = 56 m. The situation is described in the figure given below.



Here AB is the lamppost, DC is the boy and CE is the shadow of the boy.  
By using the property of similar triangles,

$$\frac{AB}{DC} = \frac{BE}{CE} \Rightarrow \frac{4200}{100} = \frac{5600+x}{x} \Rightarrow 42x = 5600 + x$$

$$\Rightarrow x = \frac{5600}{41} = 136.6 \text{ approximately.}$$

28. How many factors of  $20!$  are there whose unit digit is 5?

(a) 2068

(b) 1868

**(c) 1728**

(d) None of these

28. c The prime factorized form of  $20!$

$$= 2^{18} \times 3^8 \times 5^4 \times 7^2 \times 11^1 \times 13^1 \times 17^1 \times 19^1$$

When any factor of  $3^8 \times 7^2 \times 11^1 \times 13^1 \times 17^1 \times 19^1$  is multiplied by  $5^1, 5^2, 5^3$  or  $5^4$ , the unit digit of the resulting number will be 5.

The number of factors of  $3^8 \times 7^2 \times 11^1 \times 13^1 \times 17^1 \times 19^1 = 9 \times 3 \times 2 \times 2 \times 2 \times 2 = 432$ .

The number of factors of  $20!$  whose unit digit is 5 =  $432 \times 4 = 1728$ .

29. What does the equation  $x^4 - y^4 - 2x^3 + 2y^3 - 2yx^2 + 2xy^2 = 0$  represent?

(a) Two circles

(b) Four straight lines

**(c) A pair of straight lines and a circle**

(d) None of these

29. c  $x^4 - y^4 - 2x^3 + 2y^3 - 2yx^2 + 2xy^2 = 0 \quad \dots (i)$

Put  $y = x$  in the L.H.S. of (i):

$$x^4 - x^4 - 2x^3 + 2x^3 - 2x^3 + 2x^3 = 0 = \text{R.H.S.}$$

Hence,  $(x - y)$  is a factor of  $x^4 - y^4 - 2x^3 + 2y^3 - 2yx^2 + 2xy^2$ .

Similarly, it can be proved that  $(x + y)$  is also a factor of  $x^4 - y^4 - 2x^3 + 2y^3 - 2yx^2 + 2xy^2$ .

Dividing  $x^4 - y^4 - 2x^3 + 2y^3 - 2yx^2 + 2xy^2$  by  $x^2 - y^2$ , we get  $x^2 + y^2 - 2x - 2y$  as the quotient.

Hence, the given equation reduces to

$$(x - y)(x + y)(x^2 + y^2 - 2x - 2y) = 0.$$

$x - y = 0$  and  $x + y = 0$  are equations of straight lines.  $x^2 + y^2 - 2x - 2y = 0$  is the equation of a circle whose center is

at  $(1, 1)$  and radius is  $\sqrt{2}$  units.

30. Two right circular cones, whose heights are different, have the same slant height. The product of their base radii is equal to the product of their heights. If the base radius and the height of one of the cones are 5 cm and 6 cm respectively, then find the sum of the volumes (in sq. cm) of the two cones.
- (a)  $100\pi$       (b)  $110\pi$       (c)  $120\pi$       (d) Cannot be determined

30. b Let the base radius (in cm) and the height (in cm) of one of the cones be  $r$  and  $h$  respectively and the base radius (in cm) and the height (in cm) of the other cone be  $R$  and  $H$  respectively.

We have,  $r \times R = h \times H$

$$\text{Let } \frac{r}{h} = \frac{H}{R} = k \quad \dots(\text{i})$$

$$\text{Also, } r^2 + h^2 = R^2 + H^2 \quad \dots(\text{ii})$$

(Since the slant heights of the two cones are equal.)

From equations (i) and (ii), we get

$$h^2k^2 + h^2 = R^2 + R^2k^2$$

$$\Rightarrow h^2 = R^2$$

$$\Rightarrow h = R \text{ and } r = H$$

$$\text{Required sum} = \frac{1}{3}\pi(5^2 \times 6 + 6^2 \times 5) = 110\pi \text{ cm}^2$$



## Section – II

31. The word given below has been used in sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.

### Eat

- (a) During the downturn, many restaurants saw a drop in revenues because people were eating in.  
(b) Dinner-time manners included eating up everything that had been served on the plate.  
(c) Falling short even after the loan, she had no choice but to eat into her fixed deposits.  
**(d) She was eating away at the restaurant when the earthquake struck.**

31. d *Eating in* means to eat at home. *Eat into* means to use something valuable when you don't want to. *Eat up* means to eat all of something. *Eating away* means to destroy slowly. The correct usage in option (d) should have been just "eating at the restaurant".

32. The word given below has been used in sentences in four different ways. Choose the option corresponding to the sentence in which the usage of the word is *incorrect or inappropriate*.

### Get

- (a) It was difficult to get across the basic idea.  
(b) His interpersonal skills were so good that he got away with many a blunder.  
**(c) After much nagging, he finally got after doing his homework.**  
(d) You have got to be sharp to get ahead.

32. c To *get across* an idea means that we succeed in making other people understand it. To *get ahead* means to succeed. To *get away with* means not to get caught, criticized or punished for doing something wrong. To *get after* means to nag someone. The correct phrase in option (c) should have been to *get around* to which means to finally manage to do something.

**Directions for questions 33 and 34:** The passage given below is followed by a set of two questions. Choose the most appropriate answer to each question.

China's use of water is another rising source of tension. India's biggest rivers flow into the country from China. China is currently at work on constructing the world's largest hydroelectric dam on the Brahmaputra River, which is vital for Indian agriculture. India has agreed to treaties on water usage with its other neighbors, but China refuses to participate. This refusal to compromise underscores China's unreliability as a neighbor, says Srikanth Kondapalli, head of the Centre for East Asian Studies at New Delhi's Jawaharlal Nehru University. "While China argues for multilateralism in the international arena, it reverses that position when it comes to water," he says.

To try to overcome these political stalemates, both sides are looking to use their surging economies to rebuild relations and raise their political profiles, as they have become invaluable partners for Western markets still mired in a global downturn. "There is a desire with China to get along, and I know there is such a desire in India," says Maharaja Krishna Rasgotra, former Indian Foreign Secretary. Commerce will help soften political attitudes." Trade between India and China is expected to reach \$60 billion this year up from \$270 million 20 years ago, making China India's largest trading partner.

But there too, there are issues to resolve. India's trade deficit with China is expected to top \$20 billion this year. It's an asymmetry that both countries have pledged to correct, but India remains suspicious that, while China is happy to import its raw material while India buys China's refined goods, Chinese policy is standing in the way of Indian companies' exporting their own finished products. "They've turned India into an Africa-style raw material appendage," says Chellaney.

33. "This refusal to compromise underscores China's unreliability as a neighbor." Paraphrased the following sentence would mean

**(a) China's refusal to compromise highlights the fact that China is not a reliable neighbor to India.**

- (b) China's refusal to compromise weakens the fact that China is not a reliable neighbor to India.  
(c) China's refusal to compromise undermines the fact that China is not a reliable neighbor to India.  
(d) China's refusal to compromise conforms to the fact that China is not a reliable neighbor to India.

33. a 'Underscore', as a verb, means to make evident; emphasize. For example: He arrived early to underscore the importance of the occasion. Option (a) is the correct answer. Option (b) is incorrect as it goes against the meaning of the sentence. Option (c) states that China's refusal undermines the fact that China is not reliable. 'Undermine' means to make something, especially somebody's confidence or authority, gradually weaker or less effective. Thus, option (c) is opposite in meaning to the original statement. Option (d) can also be ruled out as conform cannot be used as a synonym of underscore.

34. According to the author, which of the following is not a trade issue that needs to be resolved between India and China?

- (a) India's trade deficit with China is expected to top \$20 billion this year.  
(b) China is content with exporting finished goods to India but not with importing them from India.  
(c) China is willing to receive imports in the form of raw material from India but not in the form of finished goods.  
**(d) China's refusal to enter a treaty on water usage with India.**

34. d Refer to the lines "It's an asymmetry...own finished products." from which (a), (b) and (c) can be inferred. (d) is incorrect. Although the use of water is an unresolved issue, it is not a trade issue that needs to be resolved.

35. Anuj, Prem, Moksh and Gyan have different weights. Each of the three statements given below contains two pieces of information of which one is true and the other is false.
- (i) Anuj is lighter than Prem. Moksh is heavier than Gyan.
  - (ii) Anuj is heavier than Moksh. Prem is lighter than Gyan.
  - (iii) Anuj is heavier than Gyan. Prem is heavier than Moksh.

If Anuj is neither the lightest nor the heaviest among the four, then who are the lightest and the heaviest, in no particular order?

**(a) Prem and Moksh**

**(c) Prem and Gyan**

**(b) Moksh and Gyan**

**(d) Cannot be determined**

35. a Let the weights of Anuj, Prem, Moksh and Gyan be represented by A, P, M and G respectively.

**Case I:** If  $A < P$ , then  $M < G$  and if  $A > M$ , then  $P > G$ .

Combining these two statements, we get  $M < A < G < P$  or  $M < G < A < P$ .

**Case II:** If  $A < P$ , then  $M < G$  and if  $P < G$ , then  $A < M$ .

Combining these two statements, we get  $A < M < P < G$  or  $A < P < M < G$ .

**Case III:** If  $M > G$ , then  $A > P$  and if  $A > M$ , then  $P > G$ .

Combining these two statements, we get  $A > M > P > G$  or  $A > P > M > G$ .

**Case IV:** If  $M > G$ , then  $A > P$  and if  $P < G$ , then  $A < M$ .

Combining these two statements, we get  $M > A > G > P$  or  $M > G > A > P$ .

Case II and III can be discarded as it is given that A is neither the heaviest nor the lightest among the four.

Also, both  $A > G$  and  $P > M$  cannot be true simultaneously (statement iii).

Hence, only possible cases are  $M < A < G < P$  (from Case I) and  $P < G < A < M$  (from Case IV).

Hence, the lightest and the heaviest among the four friends are Moksh and Prem, in no particular order.

**Directions for questions 36 to 38:** The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

Union Carbide's in-house investigation of the accident will probably not be completed before the end of February. But an inquiry under way in India is already reaching some initial conclusions. The investigation has identified a combination of design flaws, operating errors and managerial mistakes that helped cause the accident and intensified its effects. In addition, the accident has stirred serious questions about placing modern technology in less industrialized Third World nations.

The result of seven weeks' work by a team of Indian government officials, the report on the Bhopal accident will not be published until the opening of a judicial inquiry in India that is scheduled to begin in a month or so. But sources close to the investigation have disclosed some frightening findings. The main conclusions:

Plant safety procedures were inadequate to deal with a large-scale leak of the deadly methyl isocyanate, or MIC, despite the fact that the dangers such a leak would pose were known. Nor had any precautions been taken to protect people living near the plant site. Although a safety survey conducted by experts from Union Carbide headquarters in 1982 identified major hazards that could lead to serious incidents, no procedures were developed for alerting or evacuating the population that would be affected by an accident.

Leaky valves were a constant problem at the plant. Six serious accidents occurred at the Bhopal installation between 1978 and 1982, and three, one of which was fatal, involved gas leaks.

Some important safety systems were not working at the time of the accident. Refrigeration units designed to keep the highly reactive MIC cool so that it could not vaporize had been shut down before the accident. Other equipment, including devices designed to vent and burn off excess gases, was so inadequate, investigators hinted, that it would have been ineffective even if it had been operating at the time of the accident.

Plant workers failed to grasp the gravity of the situation as it developed, allowing the leak to go unattended for about an hour. Brief and frantic efforts to check the leak failed. As the situation deteriorated, the workers panicked and fled the plant.

Union Carbide, which disclosed late last month that leaks at its Institute, W. Va., plant had resulted in a revision of procedures there, has conceded that some of the information coming out of India is correct. The company has acknowledged that a backup storage tank that was supposed to be empty at the time of the accident had in fact been partly filled. But company officials declined to comment in detail on other findings until they could study the results of the investigation.

36. It can be inferred that the style of the passage is  
(a) Incriminatory      (b) Critical      **(c) Factual**      (d) Investigative
36. c The style of the passage is factual as the author presents facts surrounding the investigation of the accident at Union Carbide's Bhopal plant. The author does not incriminate or give a definitive judgment that Union Carbide was willfully responsible for the accident.
37. Which of these has not been featured in the conclusions of the investigation by the Indian government officials?  
(a) Plant safety procedures were inadequate to deal with a large-scale leak of MIC.  
(b) Failure of the plant workers to check the leak as it developed.  
**(c) Union Carbide never fully advised the national government of the dangers involved in producing and storing MIC.**  
(d) Some important safety systems were not working at the time of the accident.
37. c Option (c) has not been mentioned in the passage and is thus the correct option. Instead in the last line of paragraph three, the author states that Union Carbide did not do anything to alert the population that would be affected by an accident. Option (a) has been mentioned in the first line of paragraph three. Option (b) has been mentioned in the first line of paragraph six. Option (d) has been mentioned in the first line of paragraph five.

38. Which of the following can be inferred from the main conclusions of the investigation?
- (a) Union Carbide was aware of the steps it should take to avoid a major accident but shrewdly did not do so.
  - (b) Union Carbide knowingly took no steps to avoid a major accident.**
  - (c) Companies take fewer precautions at their plants in the developing countries in comparison to what they take in developed countries..
  - (d) The accident mentioned in the passage was a result of various factors that can be attributed to any plant functioning in the third world nations and not to Union Carbide's neglect.

38. b The last line of paragraph three leads to the inference that is given in option (b). It is clearly stated that a safety survey pointed out major hazards but Union Carbide took no steps to avoid the affect of this. The passage also mentions constant problems with safety valves and the fact that there was inadequate equipment being used in the plant. These also point to the inference that Union Carbide did not act on potential hazards. Option (a) can be ruled out because there is no clear indication in the passage that Union Carbide deliberately and with cunning avoided taking any steps. Option (c) is incorrect as one cannot conclude about the behaviour and attitude of all companies on the basis of the behaviour of a single one. Moreover, the comparison of attitude of Union Carbide towards developed and developing countries is beyond the scope of the passage. Option (d) is incorrect. Although in the last line of the first paragraph, the author does say that this accident and the following investigation has put serious doubt on building these plants in the third world countries but he does not say that Union Carbide can be excused in this matter. The author, on several occasions, does concede that Union Carbide had deliberately neglected a potential hazard.

**Directions for questions 39 and 40:** The passage given below is followed by a set of two questions. Choose the most appropriate answer to each question.

The source of income for the elderly has changed dramatically over the past three decades. Salaries were the most important source of money, but now they account for only 15% of retirees' income. Even so, the ranks of oldsters working at least part time are growing. About half the men 65 and over now work part time, vs. only 35% in 1960. A deterrent to full-time work for many retirees is that Social Security is in effect taxed at the 50% rate for earnings above \$7,320. Thus many people work just enough to keep under the cutoff.

The most important source of money for the majority of elderly people today is Social Security which, says the report, accounts for about 40% of retirees' income. Just behind that is the 25% provided by their own assets, such as savings and investments. Another major chunk comes from private pensions. Only a quarter of the work force was covered by pensions in 1950, but now half of all workers have them. In the future more and more employees will fall under various plans.

The perception that retired people are especially susceptible to inflation "is not supported by recent evidence," says the council in the dry, scholarly tone of the report. In fact, the elderly have done relatively better in keeping up with rising prices in recent years than the population as a whole. Social Security payments, tied by a 1972 law to the rate of inflation, went up 46% in real terms since 1970, while wages and salaries of people still working withered by 7%. Prices increased 312% between 1950 and 1983. During that same period, wages and salaries rose 412%, but the typical monthly Social Security payment jumped 905%. Says the report: "Thus younger families have had to work more to keep up with inflation; older families have not."

39. What is the primary purpose of the passage?
- (a) Discuss the sources of income for the elderly.
  - (b) Discuss the change in the source of income for the elderly.
  - (c) Assert that older families in the US are better off monetarily than younger families.
  - (d) Discuss the transition in the financial standing of the elderly.**

39. d The passage starts by discussing how the sources of income for the elderly have changed over the years. The last paragraph also indicates that the elderly are not as susceptible to inflation as they were and social security payments make their financial situation much easier to manage. Option (d) is the best answer. Option (a) is incorrect as the author does mention the sources of income but his primary purpose is to discuss how the standing of the elderly with respect to financial income has changed over the years. Option (b) is also mentioned by the author, but it adds to the central idea. Option (c) cannot be taken as the central idea as this is mentioned only in the last line. The author does not mention younger families and their financial situation in comparison with older families in the rest of the passage.
40. According to the author, why do many retirees work part-time?
- (a) To ensure that their total annual income falls above the taxable bracket.
  - (b) To ensure that their annual income does not lead to their being placed in the 50% tax bracket.**
  - (c) To ensure that the total annual income they earn does not fall in the taxable bracket.
  - (d) To ensure that the total annual income they get does not go towards funding their Social Security.
40. b In the first paragraph the author discusses why many retirees do not opt for full-time work. He mentions that the reason is that if their income is above \$7,320, then their Social Security is taxed at 50 per cent. To avoid this, most retirees work only to the extent that their income remains below the cutoff of \$7,320. Option (b) is the correct answer. Option (a) is incorrect as it opposite to the information given in the passage. Option (c) cannot be inferred as there is not enough information in the passage to suggest that the retirees avoid getting taxed altogether.
41. The passage given below is followed by a question. Choose the most appropriate answer to the question.

I often think it's comical  
How nature always does contrive  
That every boy and every gal  
That's born into the world alive  
Is either a little liberal,  
Or else a little conservative!

Which of the following can be conclusively inferred from the above prose?

- (a) Everyone alive is bound to take sides about some central political issues.
  - (b) Liberal or conservative tendencies are inherent in human beings.**
  - (c) Everything tends to reduce to two.
  - (d) Liberal and conservative tendencies can co-exist in every human being.
41. b As per the verse, liberal or conservative tendencies are inherent in human beings. "That every boy and every gal...conservative." Hence, (b) is the correct answer. (a) is incorrect as the words liberal and conservative may not have political connotations. (c) is also incorrect as everything being reduced to two is a generalization which is not supported by content of the verse. (d) is incorrect as the verse tells us that either of the two tendencies must exist. The verse is silent on whether these tendencies can co-exist or not.

42. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

"Day break" marks the completion of tunneling from two opposite faces. Conventionally, the tunneling work is conducted from both ends of the tunnel. But this being a very long tunnel, Railways decided to engage in simultaneous working at more than two faces by constructing a shaft towards the North end and an adit towards the South end.

(a) **Opening up of more working faces in this tunnel will enable a quicker completion.**

(b) Railways got a step closer to finishing work on the country's longest tunnel.

(c) The Pir Panjal tunnel will also have a three-metre wide road for maintenance and emergencies.

(d) Railways is using PVC membranes to line the insides of the tunnel so as to make it waterproof.

42. a The paragraph discusses the speeding up of the tunneling work. Option (a) follows the logical flow by discussing the result of speeding up the work. Option (b) could have introduced the paragraph but it does not come logically after the penultimate sentence. Option (c) is incorrect as it specifies the name of the tunnel and discusses a road for emergencies – both are beyond the scope of the information in the paragraph. Option (d) deviates from the central idea – the discussion is about the speeding up of work and not about the material used in building the tunnel.

**Directions for questions 43 and 44:** Answer the questions on the basis of the information given below.

Each of the six people – Akash, Binay, Chatur, Deepak, Ehsan and Fardeen – had two coins – one of Re. 1 and the other of Rs. 2. Each person gave his two coins to two different persons among the remaining five. It is also known that:

- (i) Each person received at least one coin.  
(ii) Akash, Deepak and Fardeen got two coins each but the total amount received by no two of the three was the same.  
(iii) Nobody among Akash, Deepak and Fardeen gave a coin to any of the other two.  
(iv) Binay received Rs. 6. The amount received by Chatur was the same as that received by Fardeen.  
(v) Chatur gave Re. 1 coin to Deepak but Deepak did not give any coin to Chatur.  
(vi) Ehsan gave one of his coins to a person from whom he received a coin.

43. Who received the second highest amount among the six people?

(a) Akash                  (b) Deepak                  (c) Chatur                  (d) Cannot be determined

44. What was the absolute difference (in Rs.) between the total amounts received by Deepak and Ehsan?

(a) 2                  (b) 1                  (c) 3                  (d) Cannot be determined

**For questions 43 and 44:**

Let Akash, Binay, Chatur, Deepak, Ehsan, Fardeen be represented by A, B, C, D, E and F respectively. From statement (ii), it can be inferred that the two coins received by A, D and F must be (1, 1), (1, 2) and (2, 2), in no particular order. Also, from statement (iii), it can be concluded that the six coins received by A, D and F must be the six distributed by B, C and E. From statement (iv), B received Rs. 6 and hence must have got a coin of Rs. 2 from each of A, D and F. Also, C received the same amount as F, which must be Rs. 2 (in form of two Re.1 coins) for each. Further analysis leads to the following table:

Given by Coin	A	B	C	D	E	F
Re. 1	C	F	D	E	F	C
Rs. 2	B	A	A	B	D	B

43. a Akash (Rs. 4)
44. a Rs. 3 – Re. 1 = Rs. 2
45. A paragraph is given below from which the last sentence has been deleted. From the given options, choose the one that completes the paragraph in the most appropriate way.

Musharraf has said the scientists were given wide latitude to develop the nuclear program and worked in secret even from top officials. That secrecy also has raised fears that nuclear workers may have transferred technology or equipment to terrorists, either for money or ideological sympathy. Experts say centrifuge technology would not be of much use to terror groups, who probably could not set up the vast facilities required to enrich useful quantities of uranium, with hundreds of technicians needed to run thousands of centrifuges.

- (a) The government also has denied official complicity in giving away technology.  
(b) Pakistan is estimated to have produced more than 1,540 pounds of highly enriched uranium.  
**(c) It is hard enough for countries to do.**  
(d) The acquisition of weapons designs would make it far easier for terrorists to make a workable bomb.

45. c The paragraph states the fear that nuclear technology could have been transferred to terrorists. However, the paragraph then changes its tone and states that experts feel that even if this were true, the technology would not be useful to terrorist groups who would need more resources. The penultimate line before the blank indicates that it will be probably impossible for terror groups to take advantage of any leaks in information or even receipt of equipment. Option (c) substantiates this by saying that it is difficult for countries themselves to gather the resources needed. Option (a) is incorrect as it brings attention to an irrelevant detail. Option (b) is out of context as the paragraph is not concerned with the amount of uranium that has been produced by Pakistan.
46. There are two gaps in the sentence given below. From the pairs of words given, choose the one that fills the gaps most appropriately.

Unable to ..... his wholehearted distaste for media events and publicity, the miffed actor continued to make ..... comments throughout his interview.

- (a) disguise; elusive  
(b) control; garbled  
**(c) conceal; caustic**  
(d) express; vitriolic

46. c The word 'miffed' in the sentence indicates that both blanks will take negative words. The sentence wants to express that because the actor was unhappy with the media he continued to make bitter comments throughout the interview. Option (a) 'to disguise' means to hide which fits in well in the first blank but 'elusive' does not go with the context as the sentence does not give any indication of why the actor will try to evade questions or be 'elusive' in his reply. The given sentence indicates bitterness on the part of the actor and hence 'caustic' is a better fit. Option (b) 'control' can fit in the first blank but 'garbled' which means 'jumbled or unclear' does not go with the sense of the sentence. Option (c) 'to conceal' means to hide which fits in the first blank. 'Caustic' means bitter. Hence, both the words are logically appropriate in the given context and option (c) is the correct answer.

47. There are two gaps in the sentence given below. From the pairs of words given, choose the one that fills the gaps most appropriately.

The sudden shift from ..... to ..... in the author's novel can startle readers, especially when he abruptly juxtaposes a scene of holy rituals with one of profane ceremonies.

- (a) decorum; frivolity
- (b) decorum; dilatory
- (c) piety; ribaldry**
- (d) fidelity; adultery

47. c 'Juxtapose A and B' means to put people or things together, especially in order to show a contrast or a new relationship between them. For example: *In the exhibition, abstract paintings are juxtaposed with shocking photographs*. Refer to the clue words 'abruptly juxtaposes', 'holy rituals to profane ceremonies' given in the sentence. Clearly, the first blank should have a positive word and the second blank a negative word. Option (c) is the best fit as 'piety' means holiness and 'ribaldry' means not refined; vulgar. The other options fail to express the contrast.

**Directions for questions 48 and 49:** Answer the questions on the basis of the information given below.

Five persons – Ashoka, Bachan, Chandra, Mallya and Tendulkar – driving five different cars among Accord, Audi, BMW, Honda City and Skoda, not necessarily in the same order, are standing in a queue at a check post. The five cars are of the different colours among Black, Red, Silver, Violet and White, in no particular order. It is also known that:

- (i) Accord is ahead of Honda City and is not Red in colour.
- (ii) Bachan is not driving Audi and his car is behind Mallya's car.
- (iii) Skoda, which is Violet in colour, is not being driven by Tendulkar.
- (iv) Ashoka's car is behind the White car and is not Silver in colour.
- (v) Chandra is not driving Accord and his car is immediately ahead of the Black car.
- (vi) The Red car, which is ahead of three other cars, is being driven by Bachan.
- (vii) The only car between BMW and Honda City is White in colour.
- (viii) Mallya is not driving the Silver car. Honda City is not Black in colour.

48. Who is driving Audi?  
**(a) Ashoka**                              (b) Chandra                              (c) Mallya                              (d) Tendulkar
49. Which car is Tendulkar driving?  
**(a) Honda City**                              (b) Audi                                      **(c) Accord**                                      (d) BMW

**For questions 48 and 49:**

From statement (vi), Bachan's car is the second from the front and is Red in colour. Hence, from statement (ii), Mallya's car is the first from the front. Now, Mallya's car is not Red in colour. From statement (v), Mallya's car is not Black in colour as it cannot be the first from the front. Similarly, from statement (vii), Mallya's car is not White in colour as it cannot be the first from the front. From statement (viii), Mallya's car is not Silver in colour. From statement (iii), it can be concluded that Mallya is driving the Violet Skoda.

Now, Bachan is not driving Skoda. From statement (i), Bachan is not driving Accord as it is not Red in colour. From statement (ii), Bachan is not driving Audi. From statement (vii), Bachan is not driving Honda City as it must be behind at least two cars. Therefore, it can be concluded that Bachan is driving BMW.

Further analysis leads to the following table:

Left to Right – Cars from First to Last					
Name	Mallya	Bachan	Tendulkar	Chandra	Ashoka
Car	Skoda	BMW	Accord	Honda City	Audi
Colour	Violet	Red	White	Silver	Black

48. a Ashoka

49. c Accord

50. The paragraph given below is followed by a question. Choose the most appropriate answer to the question.

The method by which the therapists at Vinayak Trauma Clinic bill for their time is inherently faulty. Accounting rules allow billing for a full hour even when the therapist has not worked on a specific client for a full 60 minutes. Inevitably, this practice will lead to therapists billing for more full hours than they actually work, passing on false expenses to clients anytime they counsel a client or answer the client's phone.

Which of the following, if true, constitutes the best piece of evidence for countering the claim that therapists at Vinayak Trauma Clinic are likely to bill for more full hours than they work?

- (a) Therapists at Vinayak Trauma Clinic are required to attend annual ethics seminars, during which over-billing is strongly discouraged.  
(b) Even the senior partners at Vinayak Trauma Clinic typically bill less than 40 hours per week.  
(c) Accounting rules at Vinayak Trauma Clinic only allow therapists to bill for a full hour if they have worked on more than one problem of a client in a given day.  
**(d) Therapist's fees at Vinayak Trauma Clinic are calculated based on 15-minute segments of billing time.**

50. d Option (d) is correct. This option provides adequate evidence to counter the author's claim. If fees at the clinic are determined in 15-minute segments, rather than an hourly segments, then therapists will not be able to bill for a full hour unless they have performed work during four 15-minute intervals.

Option (a) is incorrect. Though over-billing may be strongly discouraged; this option does not present conclusive evidence that abusive billing practices will be prevented.

Option (b) is incorrect. The number of hours billed by therapists at the clinic provide no evidence about the how the billing about time is done, making determination about over-billing impossible.

Option (c) is incorrect. This option would actually strengthen the author's claim that therapists are likely to bill full hours for brief tasks.

51. The paragraph given below is followed by a question. Choose the most appropriate answer to the question.

Since children consistently imitate the behaviors they see on TV, continued exposure to aggressive programs will cause more children to consider aggression as an acceptable way of solving problems. In order to promote a peaceful society, the government should ban the broadcast of aggressive programs.

Which of the following is most similar in logical structure to the paragraph?

- (a) **A mother in a family insists that a father not smoke in front of his children so that they don't pick up the habit.**
- (b) A father bans his teenage girl from watching television soaps after she is involved in a series of bickering sessions with her classmates.
- (c) A mother hides the jar of candy she usually keeps on her kitchen shelf in order to prevent her children from gorging on it and ruining their lunch.
- (d) A tour guide does not reveal to his clients the location of the town's best souvenir shop because he has been upbraided by the shop's owners for sending in too large a crowd.
51. a The author assumes in the first sentence that children who watch aggressive television programs will themselves become more aggressive by imitating such aggressive behavior. Since aggression is not desirable, the author suggests that the government deter more people from behaving aggressively by preventing the public's exposure to the cause of aggression: aggressive television programs. Also note that the passage proposes a solution designed to prevent, not to punish, aggressive behavior.  
Option (a) is correct. When a mother in a family insists that a father not smoke in front of his children, she assumes that the children will imitate an undesirable behavior. Her insistence is designed to prevent such behavior (and not to punish).  
Option (b) is incorrect. Though this option contains a similar theme to the passage, the father's decision is made after the misbehavior of his daughter's and is intended as a punishment.  
Option (c) is incorrect. This situation seems similar to the passage in logical structure, but does not cover the aspect of imitation which results in a certain type of behavior. The mother assumes a connection between the observation of candy and her children ruining their lunch by eating too much; her action is also a preventative measure.  
Option (d) is incorrect. The tour guide's action is a preventative measure, but the unpleasant outcome would come from the shop's owners, not the crowd, and would affect only the tour guide.
52. Five sentences are given below, labeled A, B, C, D and E. They need to be arranged in a logical order to form a coherent paragraph. From the given options, choose the most appropriate one.

- A. Whatever the links between them, Greek and Egyptian mythology were very different in scope and function.
- B. The historian and philosopher Plutarch probably did visit Egypt during the first century AD.
- C. Sources like these gave rise to the habit of perceiving Egypt through Greek or Roman eyes.
- D. His book *Concerning Isis and Osiris* retells and interprets many myths about this important pair of deities.
- E. This has been particularly damaging for the study of Egyptian myth.

(a) BDCEA

(b) BDEAC

(c) ABDCE

(d) ABDEC

52. a BDCEA

B mentions the name of the historian Plutarch and his visit to Egypt. 'His' in D refers to Plutarch. Thus, BD is a mandatory pair. The 'sources like this' refers to the book *Concerning Isis and Osiris* mentioned in D. So, BDC is a sequence. The 'this' in E refers to the habit of perceiving Egypt through Greek or Roman eyes. Thus, CE is also a mandatory pair. Hence, the correct sequence is BDCEA.

53. Given below are five sentences. Each sentence has a pair of words that are italicized. From the italicized words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.

He was trying to *swat* (A) / *swot* (B) a fly with a rolled-up newspaper.

She heard a floorboard *creak* (A) / *creek* (B) upstairs.

They drew their wagons into a *laager* (A) / *lager* (B) and set up camp.

Her heels *clack* (A) / *claque* on the marble floor.

He *brayed* (A) / *braid* (B) with laughter.

(a) AAABB

(b) BABBA

(c) AABBA

(d) AAAAA

53. d AAAAA

'Swat' something means to hit something, especially an insect, using your hand or a flat object. 'Swot' refers to a person who spends too much time studying. So, 'swat' is apt for the first sentence. 'Creak' means to make the sound that a door sometimes makes when you open it or that a wooden floor sometimes makes when you step on it. 'Creek' refers to a member of a Native American people, many of whom now live in the US state of Oklahoma. So, 'creak' is apt for the second sentence. 'Laager' refers to a group of wagons that were put into a circle in order to protect people in the middle. 'Lager' refers to a type of light pale beer that usually has a lot of bubbles. Thus, 'laager' is apt for the third sentence. If two hard objects clack, they make a short loud sound when they hit each other. On the other hand, 'claque' refers to a group of people who are paid to clap or boo a performer or public speaker. 'Brayed' means to talk or laugh in a loud unpleasant voice. 'Braid' means a long piece of something, especially hair, that is divided into three parts and twisted together. For example: She wears her hair in braids. 'Braid' also refers to a thin colored rope that is used to decorate furniture and military uniforms. For example: The general's uniform was trimmed with gold braid.

**Directions for questions 54 to 56:** Answer the questions on the basis of the information given below.

Twelve delegates participated in a conference, three from each of the four regions – East, West, North and South. Anu, Dev and Loni were from North; Bini, Iti and Kaya were from South; Cara, Goru and Jai were from West; and Esha, Fiza and Hina were from East. The delegates were divided into two groups – Apex and Pinnacle – having five and seven members respectively. It is also known that:

- (i) Each group had at least one delegate from each of the four regions.
- (ii) Apex had two delegates from South.
- (iii) Anu and Goru were in different groups.
- (iv) Kaya and Iti were in the same group whereas Cara and Hina were in different groups.
- (v) If Esha was in Apex, then both Jai and Goru were in Pinnacle.
- (vi) If Esha was in Pinnacle, then Loni and Dev were in different groups.

54. Who among the following was definitely in Pinnacle?

(a) Jai  
(c) Esha

(b) Cara  
(d) Hina

55. If Bini and Anu were in the same group, then which of the following statements is definitely true?  
 (a) Dev and Jai were in the same group.              (b) Loni and Hina were in different groups.  
**(c) Hina and Esha were in different groups.** (d) Both (a) and (c)
56. Which of the following statements cannot be true?  
 (a) Esha was in Pinnacle.                            (b) **Fiza was in Apex.**  
 (c) Goru was in Pinnacle.                            (d) Cara was in Apex.

**For questions 54 to 56:**

Let Anu, Bini, Cara, Dev, Esha, Fiza, Goru, Hina, Iti, Jai, Kaya and Loni be represented by A, B, C, D, E, F, G, H, I, J, K and L respectively.

From statement (i), two delegates from each region were in one group and one delegate was in the other group.

From statement (ii), the number of delegates from the regions 'North, East, West and South' in Apex and Pinnacle were '1, 1, 1 and 2' and '2, 2, 2 and 1' respectively.

From statement (iv), K and I were in Apex whereas B was in Pinnacle.

**Case I:** E was in Pinnacle.

As L and D were in different groups, A was in Pinnacle and hence G was in Apex. Subsequently, C and J were in Pinnacle and so H was in Apex. Hence, E and F were in Pinnacle. The conclusions made thus far can be tabulated as given below.

	Apex	Pinnacle
South	K and I	B
East	H	E and F
West	G	C and J
North	L/D	A and (D/L)

**Case II:** E was in Apex.

F and H were in Pinnacle. As H was in Pinnacle, C was in Apex and hence J and G were in Pinnacle. Thus, A was in Apex and D and L were in Pinnacle. The conclusions made thus far can be tabulated as given below.

	Apex	Pinnacle
South	K and I	B
East	E	F and H
West	C	J and G
North	A	D and L

54. a Jai was definitely in Pinnacle.

55. c If Bini and Anu were in the same group, E was in Pinnacle. Therefore, Hina and Esha were in different groups.

56. b Looking at both the cases we can say that Fiza was definitely not in Apex.

57. Given below are five sentences. Each sentence has a pair of words that are italicized. From the italicized words, select the most appropriate words (A or B) to form correct sentences. The sentences are followed by options that indicate the words, which may be selected to correctly complete the set of sentences. From the options given, choose the most appropriate one.

This is one of the biggest weeks in the racing *calendar* (A) / *calender* (B).

He traces his line of *descent* (A) / *dissent* (B) from the Stuart kings.

The documentary shows the life of a fashion model, *warts* (A) / *worts* (B) and all.

The reason for McCain's defeat was that his makeup could not hide wrinkles, blotches, liver spots, and *scarry* (A) / *scary* (B) tissue.

This national park provides a safe *heaven* (A) / *haven* (B) for wild life.

(a) ABAAB

(b) BBBBA

**(c) AAAAB**

(d) BABBA

57. c AAAAB

'Calendar' means a list of important events or dates of a particular type during the year. 'Calender', as a verb, means to press (as cloth, rubber, or paper) between rollers or plates in order to smooth and glaze or to thin into sheets. As a noun it means a machine for calendering something. So, 'calendar' is the apt word for the first sentence. 'Descent' refers to a person's family origins, for example: to be of Scottish descent. 'Dissent' refers to the fact of having or expressing opinions that are different from those that are officially accepted. Thus, 'descent' is apt for the second sentence. 'Warts and all' is an idiom which means including all the bad or unpleasant features of somebody/something. 'Wart' refers to a small hard lump that grows on skin and is caused by a virus. 'Wort' refers to a herb with yellow flowers, used in medicines. Thus, in the context of the given sentence, only 'warts' is appropriate. 'Scarry' means bearing marks of wounds whereas 'scary' means frightening. So 'scarry' is appropriate for the fourth sentence. 'Heaven' refers to a place or situation in which you are very happy or the place believed to be the home of God where good people go when they die. 'Haven' on the other hand refers to a place that is safe and peaceful where people or animals are protected. 'Safe haven' is a noun and it refers to a place where somebody can go to be safe from danger or attack. So, 'haven' is apt for the fifth sentence.

58. The paragraph given below is followed by a question. Choose the most appropriate answer to the question.

No living person has ever experienced what comes after death, and what comes after death is totally unlike anything that comes before. No one can conceive of a thing unless it is either something that he or she has experienced or else something that is in at least some respect like something he or she has experienced. Therefore, no living person can have a concept of what comes after death.

Which of the following can be concluded from the passage?

- (a) One can only conceive of those things which one has experienced before or are made up of elements that have been experienced before.
- (b) 'What comes after death' is an esoteric concept and cannot be understood by all.
- (c) A near death experience can help a person understand death and its consequences.
- (d) It is impossible for a living person to understand what comes after death as he has not experienced it.**

58. d Option (d) is correct as it clearly presents that a living person cannot comprehend death as there is no way he can get close to experiencing death.

(a) is incorrect as the central idea of the paragraph is to prove that a living person cannot have an understanding of what comes after death as it is an experience that he has not gone through. In addition, there is nothing that comes close to the experience of death. (b) is incorrect as the paragraph does not highlight that the concept of death is difficult to comprehend and can be understood by only a few people. The purpose of the paragraph is to highlight the impossibility of an experience that can help comprehend death. (c) is also incorrect as the paragraph clearly states that what comes after death is totally unlike what comes before it. So even a near-death experience cannot help one comprehend death.

59. Given below are four sequentially ordered statements. Each statement can be classified as one of the following:

- Facts, which deal with pieces of information that one has heard, seen or read, and which are open to discovery or verification (the answer option indicates such a statement with an 'F').
- Inferences, which are conclusions drawn about the unknown, on the basis of the known (the answer option indicates such a statement with an 'I').
- Judgments, which are opinions that imply approval or disapproval of persons, objects, situations and occurrences in the past, the present or the future (the answer option indicates such a statement with a 'J').

Select the answer option that best describes the set of four statements.

1. 16<sup>th</sup> century saw the rise of the post-war innovative artists – Stockhausen, Boulez, Robbe-Grillet, Beckett, Coover, Rauschenberg, and Beuys.
2. This is a typically postmodernist object and doesn't resemble much in the canon of modernist sculpture.
3. His work has been classified as postmodernist art and this classification has the potential to inspire the question 'Is it really art, or just a heap of bricks pretending to be art?'
4. We should be prepared to see many postmodernist ideas as very interesting and influential.

(a) FJIJ

(b) JFJJ

(c) JJIF

(d) FJIF

59. a FJIJ

Statement 1 is open to verification and hence it is a fact. Statement 2 is an opinion presented by the author. Hence, this is a judgment. In statement 3, the first half of the statement "has been classified as postmodernist art" can be taken as a fact whereas the second half of the sentence is the author's opinion. Thus, statement 3 can be classified as an inference. Statement 4 is the author's opinion and hence a judgment. The correct answer choice is option (a).

60. Two words given below have a certain relationship with each other and they are followed by alternatives. Select the alternative that has the same relationship as depicted in the original pair of words.  
*Bumptious: Humble*

- (a) Ignominious: Opprobrious  
(b) Vituperative: Contumelious  
(c) **Capricious: Immutable**  
(d) Facetious: Witty

60. c 'Bumptious' means presumptuously self-assertive. 'Humble' is an antonym of 'bumptious'. The correct answer choice is option (c). Options (a), (b) and (d) have words that are synonyms of each other.