Answers and Explanations

1	3	**2**	3	**3**	2	**4**	2	**5**	2	**6**	5	**7**	3	**8**	4	**9**	4	**10**	1
11	2	**12**	5	**13**	5	**14**	3	**15**	5	**16**	1	**17**	4	**18**	3	**19**	4	**20**	4
21	5	**22**	2	**23**	1	**24**	1	**25**	1	**26**	4	**27**	5	**28**	2	**29**	5	**30**	3
31	4	**32**	2	**33**	3	**34**	3	**35**	2	**36**	4	**37**	5	**38**	5	**39**	1	**40**	1
41	4	**42**	3	**43**	5	**44**	5	**45**	1	**46**	1	**47**	1,4	**48**	3	**49**	3	**50**	2
51	1	**52**	4	**53**	3	**54**	1	**55**	3	**56**	2	**57**	2	**58**	1	**59**	3	**60**	4
61	2	**62**	5	**63**	3	**64**	4	**65**	2	**66**	4	**67**	2	**68**	4	**69**	2	**70**	5
71	3	**72**	4	**73**	2	**74**	2	**75**	1	**76**	5	**77**	2	**78**	2	**79**	1	**80**	4
81	1	**82**	4	**83**	3	**84**	4	**85**	5	**86**	3	**87**	5	**88**	1	**89**	4	**90**	5

MY PERFORMANCE							
		Total Questions	Time Taken (Min)	Total Attempts	Correct Attempts	Incorrect Attempts	Net Score
Quantitative Ability	Section I	25					
Data Interpretation and Reasoning	Section II	25					
Language Comprehension and English Usage	Section III	40					
TOTAL		**90**	**150**				

Disclaimer: There are mismatches in our VA Answer key (Question nos. 54, 60, 66, 67 & 69) with the solutions that IIMs have provided. However, all these questions are quite controversial and Career Launcher stands by its answer key as we have debated, discussed and 'googled' it time and again.

1. 3 Total sum of the numbers written on the blackboard $= \frac{40 \times 41}{2} = 820$

When two numbers 'a' and 'b' are erased and replaced by a new number a + b – 1, the total sum of the numbers written on the blackboard is reduced by 1.
Since, this operation is repeated 39 times, therefore, the total sum of the numbers will be reduced by $1 \times 39 = 39$.
Therefore, after 39 operations there will be only 1 number that will be left on the blackboard and that will be 820 – 39 = 781.

2. 3 The last two digits of any number in the form of 7^{4n} will always be equal to 01.
For example: $7^4 = 2401$ and $7^8 = 5764801$.

3. 2 $x^3 – ax^2 + bx – c = 0$
Let the roots of the above cubic equation be $(\alpha – 1), \alpha, (\alpha + 1)$
$\Rightarrow \alpha(\alpha – 1) + \alpha(\alpha + 1) + (\alpha + 1)(\alpha – 1) = b$
$\Rightarrow \alpha^2 – + \alpha^2 + \alpha + \alpha^2 – 1 = b \Rightarrow 3\alpha^2 – 1 = b$

Thus, the minimum possible value of 'b' will be equal to – 1 and this value is attained at $\alpha = 0$.

4. 2 Amount of rice bought by the first customer

$= \left(\frac{x}{2} + \frac{1}{2}\right)$ kgs

Amount of rice remaining $= x - \left(\frac{x}{2} + \frac{1}{2}\right) = \frac{x-1}{2}$ kgs

Amount of rice bought by the second customer

$= \frac{1}{2} \times \left(\frac{x-1}{2}\right) + \frac{1}{2} = \frac{x+1}{4}$ kgs

Amount of rice remaining

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

Amount of rice bought by the third customer

$= \frac{1}{2} \times \left(\frac{x-3}{4}\right) + \frac{1}{2} = \frac{x+1}{8}$ kgs

As per the information given in the question

$\frac{x+1}{8} = \frac{x-3}{4}$ because there is no rice left after the third customer has bought the rice.
Therefore, the value of 'x' = 7 kgs.

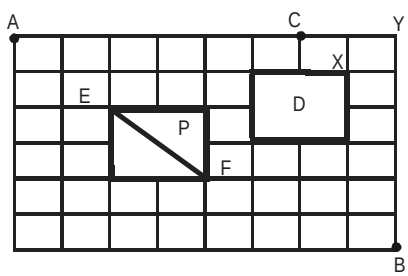
5. 2 Given that $f(x) = ax^2 + bx + c$
Also, $f(5) = –3f(2) \Rightarrow f(5) + 3f(2) = 0$
$\Rightarrow (25a + 5b + c) + 3(4a + 2b + c) = 0$
$\Rightarrow 37a + 11b + 4c = 0$ …(i)
Also, as 3 is a root of f(x) = 0, thus, f(3) = 0.
Therefore, $9a + 3b + c = 0$ …(ii)
Using equation (i) and (ii), we get that a = b
Therefore, c = –12a
$\Rightarrow f(x) = a(x^2 + x – 12) = a(x + 4)(x – 3)$
Therefore, the other root of f(x) = 0 is –4.

6. 5 $f(x) = a(x^2 + x – 12)$
Therefore, the value of a + b + c cannot be uniquely determined.

7. 3 Total number of terms in the sequence 17, 21, 25 …
417 is equal to $\frac{417-17}{4} + 1 = 101$.
Total number of terms in the sequence 16, 21, 26 …
466 is equal to $\frac{466-16}{5} + 1 = 91$.
n^{th} term of the first sequence = 4n + 13.
m^{th} term of the second sequence = 5m + 11.
As per the information given in the question 4n + 13 = 5m + 11
$\Rightarrow 5m – 4n = 2$.
Possible integral values of n that satisfy 5m = 2 + 4n are (2, 7, 12 … 97)
Therefore, the total number of terms common in both the sequences is 20.

8. 4 In other words we need to find the total number of 4-digit numbers not more than 4000 using the digits 0, 1, 2, 3 and 4.
The digit at the thousands place can be selected in 3 ways.
The digits at the hundreds place can be selected in 5 ways.
The digits at the tens place can be selected in 5 ways.
The digits at the units place can be selected in 5 ways.
Therefore, the total number of 4-digit numbers less than 4000 is equal to
$3 \times 5 \times 5 \times 5 = 375$.
Therefore, the total number of 4-digit numbers not more than 4000 is equal to 375 + 1 = 376.

9. 4



For the shortest route, Neelam follows the following path:

$A \rightarrow E \rightarrow F \rightarrow B$

No. of ways to reach from A to E: $\frac{(2+2)!}{2! \times 2!} = 6$

No. of ways to reach from E to F: 1

No. of ways to reach from F to B: $\frac{(4+2)!}{4! \times 2!} = 15$

$\Rightarrow$ Total number of possible shortest paths
$= 6 \times 1 \times 15 = 90$

10. 1 Neelam has to reach C via B.
From A to B, the number of paths are 90, as found in question 9.
From B to C, Neelam follows the route:

Case I: $B \rightarrow X \rightarrow C$

OR **Case II:** $B \rightarrow Y \rightarrow C$.

Case I: $B \rightarrow X \rightarrow C$

No. of ways to reach from B to X: $\frac{(5+1)!}{5! \times 1!} = 6$

No. of ways to reach from X to C : 2
So, total number of paths are 6 × 2 = 12 ways.

Case II: $B \rightarrow Y \rightarrow C$ **:**
There is just one way.
Therefore, from B to C, there are 6 × 2 + 1 = 13 ways
$\therefore$ Total number of ways of reaching from A to C, via B = 90 × 13 = 1170.

11. 2 f(x).f(y) = f(xy)
Given, f(2) = 4
We can also write,
f(2) = f(2 × 1) = f(2) × f(1)
OR f(1) × 4 = 4
$\Rightarrow$ f(1) = 1
Now we can also write,

$$f(1) = f\left(2 \times \frac{1}{2}\right) = f(2) \times f\left(\frac{1}{2}\right)$$

$$\Rightarrow f\left(\frac{1}{2}\right) = \frac{f(1)}{f(2)} = \frac{1}{4}$$

12. 5 seed(n) function will eventually give the digit-sum of any given number, n.
All the numbers 'n' for which seed(n) = 9 will give the remainder 0 when divided by 9.
For all positive integers n, n < 500, there are 55 multiples of 9.

13. 5 We can use the formula for the circum radius of a triangle:

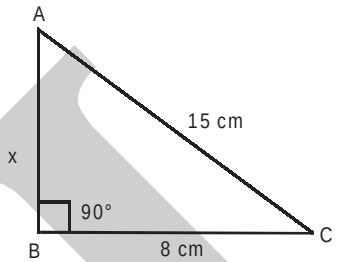
$$R = \frac{a \times b \times c}{4 \times (\text{Area of the triangle})}$$

$$\text{or } R = \frac{a \times b \times c}{4 \times \left(\frac{1}{2} \times b \times AD\right)} = \frac{a \times c}{2 \times AD}$$

$$= \frac{17.5 \times 9}{2 \times 3} = 26.25 \text{ cm}$$

14. 3 The three sides of the obtuse triangle are 8 cm, 15 cm and x cm. As 15 is greater than 8, hence either x or 15 will be the largest side of this triangle. Consider two cases:

Case I:

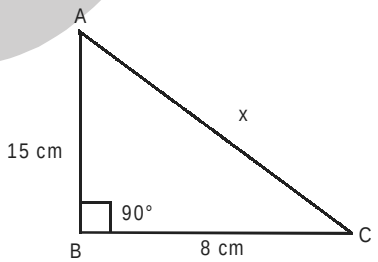


Consider the right ΔABC above,

$x = \sqrt{15^2 - 8^2} = 12.68$ cm

For all values of x < 12.68, the ΔABC will be obtuse. But as the sum of two sides of triangle must be greater than the third side, hence (x + 8) > 15 or x > 7.
Thus, the permissible values of x are 8, 9, 10, 11 and 12.

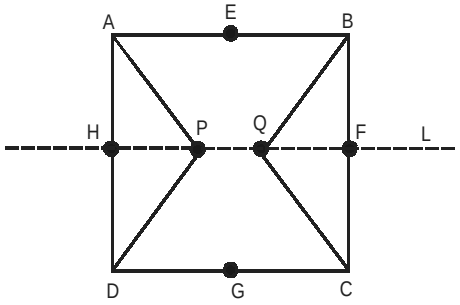
Case II:



In the right ΔABC above, $x = \sqrt{15^2 + 8^2} = 17$.

For all values of x > 17, ΔABC will be obtuse. But, as the length of third side should be less than the sum of other two sides, hence x < (15 + 8) or x < 23. The permissible values of x are: 18, 19, 20, 21 and 22.
From Case I and II, x can take 10 values.

15. 5



Let , the length of AH = 'x' cm

By symmetry of the figure given above, we can conclude that ΔAPD and ΔBQC will have the same area.

$\because \angle APD$ is 120° and line 'L' divides the square ABCD in 2 equal halves, therefore

$\angle APH = \angle HPD = 60°$

In $\Delta AHP : \frac{AH}{HP} = \tan 60° = \sqrt{3} \Rightarrow HP = \frac{x}{\sqrt{3}}$ cm

Area of $\Delta APD = 2 \times$ area(ΔAHP)

$= 2 \times \frac{1}{2} \times x \times \frac{x}{\sqrt{3}} = \frac{x^2}{\sqrt{3}}$ cm

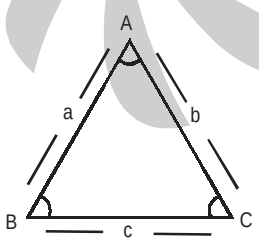
Area of ABQCDP = area (ABCD) – 2 area (ΔAPD)

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

$$\text{Required Ratio} = \frac{\frac{2x^2\left(2\sqrt{3}-1\right)}{\sqrt{3}}}{\frac{2x^2}{\sqrt{3}}} = 2\sqrt{3}-1$$

Alternate method:

Concepts used:

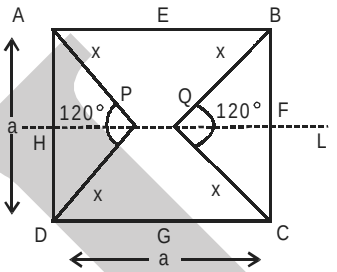


$$\Rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Also, area of $\Delta ABC = \frac{1}{2}$ ab Sin C

$= \frac{1}{2}$ bc Sin A $= \frac{1}{2}$ ac Sin B

In the given figure



For ΔAPD, Let AP = PD = x cms

$$\Rightarrow \frac{a}{\sin 120°} = \frac{x}{\sin 30°} = \frac{x}{\sin 30°}$$

$\Rightarrow \sin 120° = \sin (90 + 30) = \cos 30 = \frac{\sqrt{3}}{2}$, $\sin 30 = \frac{1}{2}$

$$\Rightarrow \frac{a}{\frac{\sqrt{3}}{2}} = \frac{x}{\frac{1}{2}} \Rightarrow x = \frac{a}{\sqrt{3}} \text{cms}$$

Thus, area of ΔAPD is $\frac{1}{2} \times AP \times PD \times \sin 120°$

$= \frac{1}{2} \times \frac{a}{\sqrt{3}} \times \frac{a}{\sqrt{3}} \times \frac{\sqrt{3}}{2} = \frac{a^2}{4\sqrt{3}} \text{cm}^2$

by symmetry, Area of ΔAPD = Area of ΔBQC

Thus, ratio of $\frac{\text{Area of ABQCDP}}{[\text{Removing area inside square ABCD}}$

$= \frac{\text{Area of square ABCD} - 2 \times (\text{Area of } \Delta APD)}{2 \times (\text{Area of } \Delta APD)}$

$= 2\sqrt{3} - 1$

16. 1 Number of terms in the given expansion is nothing but the non-negative integral solutions of the equation a + b + c = 20.
Total number of non-negative integral solutions

$= {}^{20+3-1}C_{3-1} = {}^{22}C_2 = 231$

Alternative Method:

$(a+b+c)^{20} = \{(a+b)+c\}^{20}$

$= {}^{20}C_0(a+b)^{20}.C^0 + {}^{20}C_1(a+b)^{19}.C^1 + ... {}^{20}C_{20}(a+b)^0.C^{20}$

Number of terms = 21 + 20 + 19 + ... + 1 = 231

For questions 17 to 18:

Raju bets on the horses as follows:

Red – Rs.3000 , White – Rs.2000 and Black – Rs.1000 = Total of

Rs.6000

He makes no profit no loss in the game. So the possible ways of recovering his money (Rs.6000) is as follows:

Case (i): 3000 + 3(1000)

Case (ii): 2000 + 4(1000)

Case (iii): 3(2000) + 0

Case (a): A breakup of 3000 + 3(1000) can be arrived at if the Black horse finished at 2nd and the Red horse at 3rd positions.

Then the White horse is either on the 4th or 5th position.

	1st	2nd	3rd	4th	5th
I	Grey/Spotted	Black	Red	White	Spotted/Grey
II	Grey/Spotted	Black	Red	Spotted/Grey	White

Case (b): A breakup of 2000 + 4(1000) can be arrived at if the Black horse finished at 1st and the White horse at 3rd positions.
Then the Red horse is either on the 4th or 5th position.

	1st	2nd	3rd	4th	5th
I	Black	Grey/Spotted	White	Red	Spotted/Grey
II	Black	Grey/Spotted	White	Spotted/Grey	Red

Case (c): A breakup of 3(2000) + 0 can be arrived at if the White horse finished at 2nd position.

Then the Red and Black horses must have finished at the 4th and 5th positions, not necessary in that order.

	1st	2nd	3rd	4th	5th
I	Spotted/Grey	White	Grey/Spotted	Red/Black	Black/Red

17. 4 None of the cases has three horses between White and Red horses.

18. 3 If Grey came fourth, we consider cases (a) and (b). All the options except (c) can hold true for these cases. White horse can either be 2nd or 5th in the race.

19. 4 **Statement A:** If the number of players at the entry level is 83, we can get the following table.

Round	Number of players	Pair of players	Byes	Number of matches
1	83	41	1	41
2	41 + 1 = 42	21	0	21
3	21	10	1	10
4	10 + 1 = 11	5	1	5
5	5 + 1 = 6	3	0	3
6	3	1	1	1
7	1 + 1 = 2	1	0	1

Since we do not know the number of byes given to the champion, we cannot ascertain the number of matches played by him.
Hence, statement A alone is not sufficient.
Statement B: The champion received one bye, but no information is given regarding the number of entrants in the tournament.
Hence, statement B alone is not sufficient.

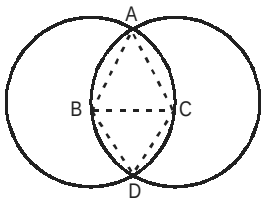
Combining statements A and B, we get that the total number of matches played by the champion = 7 - 1 = 6
Hence, statements A and B both are required to answer.

20. 4 **Using statement A:**
When n = 127, exactly one bye is given in round 1.
When = 96, exactly one bye is given in round 6.
As no unique value of n can be determined, hence, statement A alone is not sufficient.

Using statement B:
As we do not know exactly how many bye 5 are given in total, we cannot determine the value of n, uniquely.

Combining statement A and B:
There is a unique value of n = 124, for which exactly 1 bye is given from the third round to the fourth round.

21. 5



It is given that AB = BC = AC = BD = DC = 1 cm.

Therefore, ΔABC is an equilateral triangle.

Hence, $\angle ACB = 60°$

Now area of sector $\widehat{AB} = \frac{60}{360} \times \pi(1)^2 = \frac{\pi}{6}$

Area of equilateral triangle $\Delta ABC = \frac{\sqrt{3}}{4}(1)^2 = \frac{\sqrt{3}}{4}$

Area of remaining portion in the common region $\widehat{ABC}$ excluding ABC

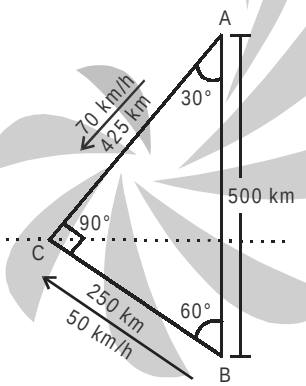
$= 2 \times \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4} \right)$

Hence, the total area of the intersecting region =

$2 \times \frac{\sqrt{3}}{4} \times (1)^2 + 4 \times \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4} \right)$

$= \frac{2\pi}{3} - \frac{\sqrt{3}}{2}$ sq. cm.

22. 2 As per the conditions given in the questions, we get the following figure.



The train leaving at B reaches C at 1:00 p.m. taking a total time of 5 hours, which means that Rahim should reach C by 12:45 p.m.

Now total time taken by Rahim moving with a speed of 70 km/hr is 't'.

$t = \frac{250\sqrt{3}}{70}$ km/hr = 6 hrs 12 mins (approx)

The time by which Rahim must start from A = 13 : 00 – 0 : 15 – 6 : 12 = 6 : 33

Therefore, the latest time by which Rahim must leave A and still catch the train is closest to 6:30 a.m.

23. 1 Let the three consecutive positive integers be equal to 'n – 1', 'n' and 'n + 1'.

$\Rightarrow n - 1 + n^2 + (n+1)^3 = (3n)^2$

$\Rightarrow n^3 + 4n^2 + 4n = 9n^2$

$\Rightarrow n^2 - 5n + 4 = 0$

$\therefore n = 1$ or $n = 4$

Since, the three integers are positive, the value of 'n' cannot be equal to 1, therefore the value of 'n' = 4 or m = n – 1 = 3.

Hence, the three consecutive positive integers are 3, 4 and 5.

24. 1

$$S = \sqrt{1 + \frac{1}{1^2} + \frac{1}{2^2}} + \sqrt{1 + \frac{1}{2^2} + \frac{1}{3^2}} + \ldots + \sqrt{1 + \frac{1}{2007^2} + \frac{1}{2008^2}}$$

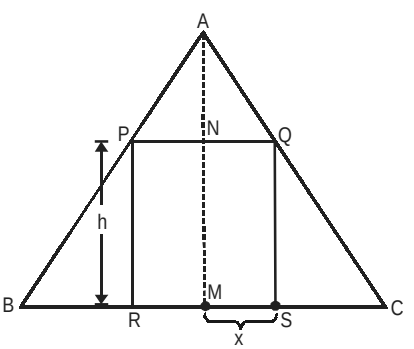
$$T_n = \sqrt{1 + \frac{1}{n^2} + \frac{1}{(n+1)^2}}$$

$$= \sqrt{\frac{n^4 + 2n^3 + 3n^2 + 2n + 1}{n^2(n+1)^2}}$$

$$= \frac{n^2 + n + 1}{n^2 + n} = 1 + \frac{1}{n^2 + n}$$

$$S = \sum_{n=1}^{2007} T_n = 2007 + \sum_{n=1}^{2007} \left\{ \frac{1}{n} - \frac{1}{n+1} \right\} = 2008 - \frac{1}{2008}$$

25. 1



Let, the height of the cylinder be 'h' cm and radius be 'x' cm.

ΔANQ is similar to ΔQSC

$$\Rightarrow \frac{AN}{NQ} = \frac{QS}{SC} \Rightarrow \frac{10-h}{x} = \frac{h}{4-x}$$

$$\Rightarrow \frac{10}{h} - 1 = \frac{x}{4-x} \Rightarrow \frac{10}{h} = \frac{4}{4-x}$$

$$\therefore h = \frac{5}{2}(4-x)$$

Surface area of the cylinder PQSR

$$= 2\pi\left[x^2 + hx\right] = 2\pi\left[x^2 + \frac{5x}{2}(4-x)\right]$$

$$= 2\pi\left[x^2 - \frac{5}{2}x^2 + 10x\right] = 2\pi\left[10x - \frac{3}{2}x^2\right]$$

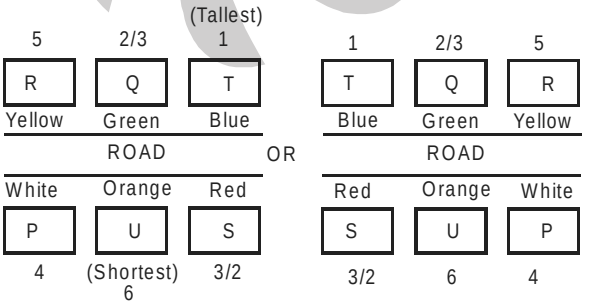
$$= 2\pi\left[-\frac{3}{2}\left(x - \frac{10}{3}\right)^2 + \frac{50}{3}\right]$$

Maximum value of surface area of the cylinder will be at $x = \frac{10}{3}$.

For questions 26 to 28:
The given information can be depicted as follows.
(i)

(ii) Six houses – P, Q, R, S, T, U
(iii) Colours – Red, Blue, Green, Orange, Yellow, White
(iv) Different heights
(v) T = tallest & opposite to Red
(vi) Shortest opposite to Green
(vii) U = orange & the position of U is: P/S U S/P
(viii) R = yellow & opposite to P
(ix) Q = Green & opposite to U
(x) P = White & (S, Q) > P > R (in height)

From (iv), (v), (vi), (ix) & (x), T > (S, Q) > P > R > U in terms of height
From (iv), (vii), (viii), (ix) & (x), we get the following two cases.



26. 4 Diagonally opposite to yellow is red.

27. 5 Second tallest house is either Q or S. So, we can not determine.

28. 2 Tallest house is T whose colour is Blue.

29. 5 Let volume of data transfer in India = Volume of data transfer in Singapore = x

For INDIA:

ARDT for India $\approx$ \$1 (approx)

$\therefore$ Revenue from data transfer = \$x (approx)

$$\frac{\text{Revenue from data transfer}}{\text{Total Revenue}} \times 100 = 9\% \text{ (approx)}$$

$$\Rightarrow \text{Total Revenue} \simeq \frac{x}{9} \times 100 \text{ (approx)}$$

For SINGAPORE:

ARDT = \$9 (approx)

$\therefore$ Revenue from data transfer = \$9x (approx)

$$\frac{\text{Revenue from data transfer}}{\text{Total Revenue}} \times 100 = 20.5\% \text{ (approx)}$$

$$\Rightarrow \text{Total Revenue} = \frac{9x}{20.5} \times 100 \text{ (approx)}$$

$$\frac{\text{Total Revenue for Singapore}}{\text{Total Revenue for India}} = \frac{\frac{9x}{20.5} \times 100}{\frac{x}{9} \times 100} \approx 4 \text{ (approx)}$$

30. 3 Let total revenue of Sweden in 2010 = x
Therefore total Revenue of India in 2010 = 2x

For Sweden in 2010:

ARDT = \$6
Revenue from data transfer = 2 × 18% of x

$\therefore$ Volume of data transfer = $\frac{2 \times 18\% \text{ of } x}{6}$

For India in 2010:

Let ARDT = y

Revenue from data transfer = $3 \times 9\%$ of $2x$

$\therefore$ Volume of data transfer = $\frac{3 \times 9\% \text{of } 2x}{y}$

Therefore $\frac{2 \times 18\% \text{of } x}{6} = \frac{3 \times 9\% \text{ of } 2x}{y} \Rightarrow y = \$9$

Therefore % change in ARDT of India

$$= \frac{9-1}{1} \times 100 = 800\%$$

31. 4 **For UK**:

$$\frac{\text{Revenue from Data transfar}}{\text{Total Revenue}} \times 100 = 30\%(\text{approx})$$

$$\text{Revenue from Data transfer} = \frac{30}{100} \times \text{Total Revenue}$$

ARDT = $ 13 (approx)

$$\therefore \text{Volume of Data transfer} = \frac{30}{100} \times \frac{\text{Total Revenue}}{13}$$

$$\approx \frac{3}{130} \times \text{Total Revenue}$$

For Spain:

$$\frac{\text{Revenue from Data transfar}}{\text{Total Revenue}} \times 100 = 15\%(\text{approx})$$

ARDT = 6.5 (approx)

$$\therefore \text{Volume of Data transfer} = \frac{15}{100} \times \frac{\text{Total Revenue}}{6.5}$$

$$\approx \frac{3}{130} \times \text{Total Revenue}$$

Similarly, we can check the other options and easily see that the volume of data transfer is NOT the same for given pair countries.

32. 2 Since Bhama got calls from all colleges, she has to score marks in each section equal to at least the maximum of the cut-offs across colleges which means 45, 45, 46 & 45 in section A, B, C & D respectively. This makes her total to be 181 with which she will clear the overall cut-offs of all institutes also.

33. 3 Since we have to minimise the marks in a particular section, we will have to maximise the marks in other 3 sections. Let us assume that marks obtained in each of the three sections in which we are going to maximize the score, is equal to 50. Now, the lowest overall cut-off is 171 & second lowest is 175. Hence, Charlie must have scored at least 175 – (50 + 50 + 50) = 25 marks in the remaining section.

Let us confirm whether he can clear sectional cut-offs also with such a distribution. On seeing the sectional cut-offs, we conclude that they can be cleared with 50 marks each in section A, B & C and 25 marks in section D, which may enable Charlie to clear the sectional cut-off of section D for college 1, 2, 3 or 5. Hence, 25 is the correct answer.

34. 3 Since we have to maximize Aditya's marks, let us take the base values of 50 marks in each section and try to reduce that by minimum values to ensure he doesn't get any call. We notice that by reducing the marks obtained in section C to 41, we ensure colleges 1, 2, 3 & 5 are ruled out. Now for colleges 4 & 6, reducing the marks obtained in section D to 43, ensures these colleges are also ruled out. Please note that we are reducing the score to 1 less than the minimum cut-off across all colleges for that particular section.
In the other two sections A and B, Aditya may score 50 each. So the maximum possible aggregate marks = 50 + 50 + 41 + 43 = 184.

For questions 35 to 38:
The given basic information can be collated as below:
(i) Six teams – A, B, C, D, E, F.
(ii) Matches scheduled in two stages – I & II.
(ii) No team plays against the same team more than once.
(iv) No ties permitted.
As per the instructions given for stage – I, we can reach the following conclusions:
(a) As B lost at least one match, A won all the 3 matches.
(b) The two teams who lost all the matches cannot be A (as explained above), cannot be B (E lost to B), cannot be D (D won against C & F). Hence, the two teams must be C and F.
(c) F did not play against the top team (i.e. A).
We get the following table for stage – I.

(To be read from rows)

	A	B	C	D	E	F
A	X	W	W	W		
B	L	X			W	W
C	L		X	L	L	
D	L		W	X		W
E		L	W		X	W
F		L		L	L	X

As per the instructions given for Stage-II, we can reach the following conclusions.
(d) A lost both its matches against E and F.
(e) F won against A, hence is the bottom team (out of C & F) which won both the matches
$\Rightarrow$ F won against C as well.
This also means that C lost both its matches against B and F.
(f) Apart from A and C, one more team lost both the matches in Stage-II.
That team can neither be E (A lost to E), nor B (as C lost to B), nor F (as F won both its matches).
Hence, the team must be D.

We get the following table for Stage-II.

(To be read from rows)

	A	B	C	D	E	F
A	X				L	L
B		X	W	W		
C		L	X			L
D		L		X	L	
E	W			W	X	
F	W		W			X

35. 2 E and F defeated A. **[Please note that in this question, options (1) and (5) were the same.]**

36. 4 B, E and F won both the matches in Stage-II.

37. 5 D and F won exactly two matches in the event.

38. 5 B and E have most wins, 4 each.

39. 1 Subscription in Europe in 2006 = 380 Mn USD
Subscription in Europe in 2007 = 500 Mn USD

$$\% \text{ change in } 2007 = \frac{500-380}{380} \times 100 \approx 30\%$$

Therefore subscription (based upon the growth rate of 2007 over 2006) in 2008 should have been
= 500 × 1.3 = 650 Mn USD (approx)
Therefore difference from the estimated subscription = 650 – 600 = 50 Mn USD (approx)
[Please note that the unit is mentioned neither in the question, nor in the options]

40. 1 Let the total number of subscribers = 100x
Number of men = 60x
Therefore number of men in 2010 = $60x \times (1.05)^7$
= 84.42x (approx)
Number of women = 40x
Therefore, number of women in 2010 = $40x \times 1.1^7$
= 77.94x (approx)
Therefore, total number of subscribers = 84.42x + 77.94x
= 162.36x
Percentage growth of subscribers

$$= \frac{162.36x - 100x}{100x} = 62.36 \text{ (approx)}$$

41. 4 Gap in 2008 = 780 – 600 = 180 Mn USD
Gap in 2009 = 810 – 700 = 110 Mn USD

$$\text{Annual \% change} = \frac{110-180}{180} \times 100 = -39\%$$

Absolute change = 39% which is the highest.
Among the other options, option (3) '06-07' is closest, but it will lead to only 22% change in gap.

42. 3 $\text{Growth rate of 2007} = \frac{500-380}{380} \times 100 = 31.58\%$

$\text{Growth rate of 2005} = \frac{280-190}{190} \times 100 = 47.37\%$

Therefore % change in growth rate of 2007 relative to growth rate of 2005 is

$$\frac{47.37 - 31.58}{47.37} \times 100 \approx 35\%$$

43. 5 Since we do not know what are the share prices during different times of the day we cannot come to any conclusion.

44. 5 Abdul buys all his shares at 10 am while the other two purchases once every hour. Since the share prices throughout the day is not specified, we cannot compare the returns of Abdul with the other two. Let us observe the strategies adopted by Bikram and Chetan.
Bikram buys equal number of shares every one hour, irrespective of their prices.
Chetan invests equal amount every one hour, irrespective of the share prices. This means that higher the share price, lesser the number of shares purchased by him. This in turn reduces his return. So whenever the prices are changing, Chetan's returns will be higher than Bikram's. In case, the share prices remain the same, the returns of Bikram and Chetan will be equal.
Hence, the correct option is (5) – none of the above.

45. 1 As the share prices are increasing throughout the day, the earlier a person invests, the more profitable it would be. Therefore, Abdul who invested in the beginning only, had reaped in the maximum return.
Between Bikram and Chetan, Bikram bought a fixed number of shares every one hour, i.e. towards the end , he must have bought the same number of shares at an even higher rate. Meanwhile, Chetan invested same amount every one hour, i.e. he bought higher number of shares when the prices were low and vice versa. Hence, Chetan's return will be definitely higher than Bikram's.

Additional data for questions 46 to 47:
Let the share prices (in Rs.) at 10 am, 11 am, 12 noon, 1 pm, 2 pm and 3 pm be a, b, c, d, e and f respectively.
Abdul purchased all his shares at 10 am and sold off the same at 3 pm. It is given that he incurred a loss. If he bought n shares, then his investment = na must be more than his sale price = nf, i.e. $na > nf \Rightarrow a > f$ … (i)
Similarly, Emily bought/sold same number of shares at 10 am/12 noon and 1 am/3 pm and finally made profit.
i.e. $c + f > a + d$ … (ii)
Similar observation for Dane can be made
i.e. $d + e + f > a + b + c$ … (iii)

It is given that share price at 12 noon is less than the opening price, i.e. $a > c$ … (iv)

Also, share price at 2 pm is lower than the closing price

i.e. $f > e$ … (v)

From (i) and (ii), we get $c > d$ … (vi)

From (i), (iii) and (vi), we get $e > b$

Hence, we have $a > f > e > b$ and $a > c > d$.

46. 1 The share price was the highest at 10 am.

47. 1 and 4

Share price was lowest either at 11 am or 1 pm. Therefore, option (a) is false.

Share price at 1 pm was higher than that at 12 noon (equation (vi)).

48. 3 Average gross pay of HR department before transfer

= Rs. 5000 × 1.7 = Rs. 8500

Basic pay of the transferred person = Rs. 8000

New allowance of the transferred person = (80 + 10) = 90% of the basic pay

New Gross pay of the transferred person

= Rs. 8000 × 1.9 = Rs. 15,200

New average gross pay of HR dept.

$$= \text{Rs. } 8500 + \left(\frac{15200 - 8500}{6}\right) = \text{Rs. } (8500 + 1116)$$

$$\text{Percentage change } = \frac{1116}{8500} \times 100 \approx 13\%$$

49. 3 Since increase in average age of the Finance department. is one year, the age of the person moving from Marketing to Finance is more than that moving from Finance to Marketing, by 1 × 20 = 20 years.

Hence, due to this transfer, cumulative age of Marketing department has gone down by 20 yrs. But since the average age of Marketing department remaining unchanged, the person moving from Marketing to HR has age = (Avg. age of Marketing) – 20 = 15 years.

$$\text{New average age of HR dept.} = \frac{(5 \times 45) + (1 \times 15)}{5 + 1}$$

= 40 yrs.

50. 2 Total basic pay of HR

= 5 × 5000 (existing) + 2 × 6000 (from Maintenance) + 1 × 8000 (from Marketing) = Rs. 45,000

$$\text{New average} = \frac{45{,}000}{8} = \text{Rs. } 5{,}625$$

$$\text{Percentage change} = \frac{625}{5000} \times 100 = 12.5\%.$$

51. 1 Sentence A is incorrect as the spelling of 'imigrant' is not correct , should be 'immigrant'. Sentence D is incorrect because of a missing article and should be ' the owner of a dry goods ….'. Sentence E is incorrect and should be '….. would later be known as…..'. Sentence C is incorrect. We require a comma between 'brother-in-law' and 'David Stern'.

52. 4 Sentence B should be'….its labour policy' because the subject is Nike and we can't substitute it with the plural pronoun 'their'. Sentence C should be 'Perhaps sensing that the rising tide…' as without 'that' the sentence structure is incomplete. Sentence E should be ' ….an industry..' as the word industry begins with a vowel so the appropriate article is 'an'.

53. 3 Sentence B should be '…few millions…. 'Sentence D should be … reach the hundreds who are marooned.. Sentence E is incorrect as per subject verb agreement and should be '…death count has begun'.

54. 1 Sentence B has tense inconsistency, it should be '…I associated you…'. Sentence C has a similar error and should be '….who seemed…'. Sentence D has an error of modifier placement and should be '…not in the least curious..' Sentence E has a missing article, should be'…you did make an effort…'.

55. 3 In option (1) Anita wore a *brooch* is the correct option. As broach means to mention and suggest for the first time. While *brooch* means a clasp or an ornament. In the second sentence one has to meet a *councillor* to complain about neighbourhood amenities as a *councillor* draws from the word council - which is responsible for keeping the county in order. A *counsellor* is one who helps you take an informed decision about one or more of your concerns, therefore *councillor* is the right option here. In the third sentence *advice* has to take the noun form and not the verb form, therefore *advice* is the right option. *When Mr. Raymond advises people, he gives them advice. Climactic* refers to climax, while *climatic* to weather conditions, therefore climactic is the right option. *Flair* refers to a natural talent; it is commonplace to say that one has a *flair for writing. Flare* means to spread gradually outward, as the end of a trumpet, the bottom of a wide skirt, or the sides of a ship. Therefore, BAAAB (3) is the right option.

56. 2 *Currents* refer to prevailing or flowing, while *currants* are deciduous shrubs; therefore B is the right option. In the second sentence, *exceptional* means unusual or extraordinary. While, *exceptionable* means objectionable. *Assent* means to concur to or subscribe to. While *consent* means to agree, comply or yield. In the third sentence *obliged* refers to bind morally or legally, as by a promise or contract. While, *compelled* refers to being forced. Therefore, A is the correct option. *Sanguine* refers to being cheerfully optimistic, 'far too' in the sentence provides the cue to choose

option A. While *genuine* refers to authenticity and is usually not used with *far too.* Therefore BBAAA (2) is the right option.

57. 2 *Caustic* refers to severely critical or sarcastic, while *ironic* draws from irony which refers to the use of words to convey a meaning that is the opposite of its literal meaning. Therefore B is the correct option. *Cogent* refers to clear, or an incisive presentation. While *valid* refers to being sound. And, being impassionate usually does not necessitate being valid. *Averse* means having a strong feeling of opposition, or antipathy. While *adverse* refers to something being unfavourable. Therefore B is the correct option. *Coup* is a clever action or accomplishment. A *coupé* is the end compartment in a European railroad car. Therefore, A is the correct option. *Peal* refers to a ringing of a set of bells, especially a change or set of changes rung on bells. While, *peel* refers to that which is peeled from something, as a piece of the skin or rind of a fruit. Therefore, B is the right option. Therefore, BBBAB (2) is the right option.

58. 1 *Defusing* means to remove the fuse from a bomb, mine etc. *Diffuse* means to spread or scatter widely or disseminate. Therefore B is the right option. *Baited* means to entice, especially by trickery or strategy. While, *bated* means to lessen or diminish; abate. Therefore, A is the right option. In sentence three *hoard* refers to a supply or accumulation that is hidden or carefully guarded for preservation. While, *horde* refers to a large group, mass or crowd. Therefore B is the correct option. In sentence four *interment* refers to burial, while *internment* refers to restrict to or confine within prescribed limits. Therefore B is the correct option. In sentence five *unsociable* refers to showing, or marked by a disinclination to friendly social relations; withdrawn and *unsocial* comes close in meaning to *unsociable* and is used more specifically when talking about predispositions or tendencies. Therefore, your answer choice should have corresponded with the options in the previous sentences treating these two words as synonyms. Therefore BABBA (1) is the correct answer.

59. 3 In Sentence 3 'run over' as a phrasal verb means being physically mowed down and it is not appropriate to convey the symbolic sense of brow beating somebody.

60. 4 Sentence 4 is incorrect and should be ' The doctor is on a round/the doctor is on a round of the hospital.'

61. 2 The expression 'the horse suddenly broke into a buckle' is idiomatically incorrect. The correct idiomatic expression is "broke into a gallop".

62. 5 In sentence 5, the expression '…a soldier broke the file…' is grammatically incorrect. The correct idiomatic expression is "broke ranks".

63. 3 The word 'disingenuous' means insincere and is suitable in the given context (suggested by the word- 'sinister') . The word 'victims' brings out the contrast with 'perpetrators' most aptly.

64. 4 In the first blank the word 'scrutinizers' is inappropriate as the context suggests observation and not analysis, therefore 'observers' is the right word. In the second blank 'concede' would be more appropriate than 'agree' as the sense is that of yielding ground as suggested by the expression 'forced to…'

65. 2 The best option is 2 (congenital, education) as the word 'environment' in the sentence is used figuratively to suggest the overall surroundings/conditions which shape a person. Option 3 seems close but is incorrect as the word 'climate' is insufficient to convey this figurative sense of environment.

66. 4 Going by the first blank, option (3) and (4) are close. In the second blank the context requires a word which goes along with the sense of 'minds' which are accustomed to the former or the old school of thought and hence the word 'tradition' aptly fits in here.

67. 2 In the paragraph the author suggests why the doctor loses some of his patients. Option 5 can be easily eliminated as the pronoun "these" has no antecedent in the para. Option 3 & 4 are farfetched as they are to do with the doctor's attitude towards the problem, which the para does not indicate in any way. Option 1 can also be done away with as it suggests those patients who fail to speak up and not about those who leave his treatment, as indicated in the para. Option 2 fits in perfectly as it speaks of those who have no other alternative but to seek his treatment.

68. 4 Options 1 and 3 are very generalized statements. Option 2 is a repetition of the idea presented in the beginning of the paragraph. The para talks about how developed countries indulge in trade protectionism as a move against China and India's economic rise , under the guise of climate concern. Option 4 and 5 talk about the same thing but 4 goes along with the subtle suggestive tone of the para while 5 is more curt in its accusation of 'perpetrators of inequity'.

69. 2 The para is a description of the Jewry settlement,. (4) can be eliminated as it brings in a hint of skepticism. (3) is a mere repetition of an idea already discussed in the para (that of jews being tolerant). (5) can also be eliminated as it is brings an alien concept – that of Mattancherry's popularity with the tourists . Between (1) and (2), we will eliminate (1) as it has a more conclusive tone, which is not in sync with the descriptive nature of the paragraph.

70. 5 Option 1 can be easily eliminated as it is a mere repetition of the ideas presented in the para. Option 2 is a little farfetched as it should come one or two more sentences later in the para . Option 3 does not match with the idea presented in the passage. Option 4 does not match with the tone of the paragraph. Option 5 completes the idea as the emphasis in the last line of the para is that the idea of 'pure Western and pure Indian thoughts' is deceptive.

71. 3 Refer to the 4th paragraph of the passage. The elders were of the opinion that turning of the eyes by the child while having the ice-creams in both hands could make the child fall down or trip over stones, steps in the pavement. The phrase 'rightly suggested' changes the meaning of the given sentence and hence it cannot be inferred from the passage.

72. 4 'Parvenus' refer to persons who have suddenly risen to a higher social and economic class but have not yet received social acceptance by others in that class. Hence, the phrase 'little parvenus' would appropriately refer to 'young upstarts'.

73. 2 Refer to the 5th paragraph of the passage. The sentence 'two two-cent ….suggested excess' clearly tell us that it was intemperance on part of the author which made him pine for two two-cent ice-cream cones instead of one four-cent pie.

74. 2 In the lines 'Nowadays the moralist .....spoiled'. The author is talking about morality in the context of the present day world. The rest of the options are out of the scope of the passage.

75. 1 Refer to the last line of the 4th paragraph of the passage. Here the author says that the intentions of his elders in not letting him eat two-cent cones was 'cruelly pedagogical'. This implies that the justification was 'didactic' in nature. This makes option (1) correct. The rest of the options are incorrect in context of the passage. 'Dietetic' refers to anything related with diet or the use of food. 'Dialectic' refers to the nature of logical argumentation. 'Diatonic' refers to using only the seven tones of a standard scale without chromatic alterations. 'Diastolic' refers to the rhythmically occurring relaxation and the dilation of the heart chambers.

76. 5 According to popular wisdom, language is a cultural artifact or cultural invention or it is part of the leaning process or it is unique to *Homo sapiens*. But option(5) has been stated as the viewpoint of the cognitive scientists as can be seen in the lines 'Language is a complex specialized.....module'. The author also agrees with the cognitive scientists' view as he confirms to the view that language comes by instinct. He further corroborates this by saying that people know how to talk in the same manner as spiders know how to spin the web.

77. 2 "Spiders know how to spin webs" highlights the inherent qualities of living species. This analogy can be replaced in a similar way by "Bees collecting nectar" which is also a part of their inane trait. Options(1), (3), (4), (5) mention traits which are acquired over a period of time by putting in some kind of effort in order to be adept at them.

78. 2 Refer to the last sentence of the 2nd paragraph of the passage. It states that 'In nature's talent show, we are simply a species of primate with our own act, a knack for communicating information about who did what to whom by modulating the sounds we make when we exhale'. Hence, communicating with each other through voice modulation is the unique quality of human beings as per the passage.

79. 1 Refer to the 3rd paragraph of the passage where the author says that the scientists believe that the complexity of language is part of our biological birthright. He further illustrates the scientists' point of view that it cannot be taught. The author strengthens this view by quoting Oscar Wilde, making option(1) as the correct answer option. The rest of the options are not mentioned in the passage.

80. 4 Throughout the passage, the author is talking about language as a type of instinct that is existent is human beings and not any specific attribute or skill that is learnt by them over a period of time. In the first paragraph, the author claims 'But I prefer the admittedly quaint term instinct'. Similarly in the last paragraph of the passage, the author concludes by saying that 'Finally, since language is the product of a well engineered biological instinct, we shall see that it is not the nutty barrel of monkeys that entertainer-columnists make it out to be'.

81. 1 The 2nd paragraph of the passage begins with 'With those caveats, it appears to me that one strand consisted .....to prevent bracken ferns from over running the fields'. Hence in the context of Rwanda and Haiti, the author is referring to the existence of too many people fighting for limited land and other resources. Hence, option (1) is the most appropriate answer.

82. 4 'Anthropogenic' refers to being caused or produced by human beings. So 'anthropogenic drought' refers to the drought caused by actions of human beings. Further hint is given in the 8th line of the 2nd paragraph of the passage.

83. 3 In the 3rd paragraph, refer to the lines 'At the time of previous droughts.....to have reliable water supplies'. Hence, it is evident that the final drought which caused the collapse of the Maya civilization was different from the previous droughts because man had left no unoccupied land away from agriculture to start life in a new way.

84. 4 The first paragraph of the passage states that 'To summarize the Classic Maya collapse, we can tentatively identify five strands. I acknowledge, however, that Maya archaeologists still disagree vigorously among themselves-in part, because the different strands evidently varied in importance among different parts of the Maya realm; because detailed archaeological studies are available for only some Maya sites, and because it remains puzzling why most of the Maya heartland remained nearly empty of population and failed to recover after the collapse and after re-growth of forests'. Hence, there is not one specific factor that can individually explain the collapse of the Maya civilization. Therefore, the correct answer would be option 4.

85. 5 The answer is clearly indicated in the 4th paragraph of the passage where it is mentioned that the Maya kings and leaders were more focussed on their short-term concerns of enriching themselves. The entire Maya population was not obsessed with its short-term interests. Hence, it cannot be cited as one of the factors causing the collapse of the Maya society.

86. 3 In the first paragraph of the passage, refer to the lines 'Many of the concepts of modern art, by contrast, have resulted from the almost accidental meetings of groups of talented individuals at certain times and certain places'. Hence, option 3 is the reason for the emergence of the concepts of modern art.

87. 5 According to the author, with the passage of time an art movement ceases to be a living organism and it becomes a fossil. The author then takes the example of a scientist who reconstructs the life of the past era which are codified in the form of messages in the structure of a fossil. He goes on to say similarly an artist also analyses the intellectual and creative possibilities from the art movements of the past. 'Fossil' here signifies the temporal phasing of an era associated with the art movement. This makes option 5 the correct option. Option 1 is contradictory to the facts mentioned in the passage. In option 2, the word 'historic' means significant which is not being indicated by the author. Option 3 is contradictory to the author's point of view. Option 4 is out of the scope of the argument.

88. 1 Refer to the first sentence of the first paragraph of the passage where science and art have been stated as similar in including a whole range of separate, though interconnecting activities. Hence, option(1) is the correct answer.

89. 4 In the first paragraph of the passage, refer to the lines 'Briefly, then, the concepts of modern art are of legitimately.....visual and spiritual experience'. Hence, the ideologies of the art of the twentieth century can be better realised by the fast changing world of visual and metaphysical understanding. The rest of the options have no link with the concepts and ideologies of the art of the twentieth century.

90. 5 In the last paragraph of the passage, refer to the lines 'As T.S Eliot observed, no one starts anything from the scratch however consciously you may try to live in the present, you are still involved with a nexus of behaviour patterns bequeathed from the past. The original and creative person is not someone who ignores these patterns but someone who is able to translate and develop them so that they conform more exactly to his and our present needs'. Hence, new and original thinking is always developed on the basis of the past thoughts in order to cater to the modern needs. Therefore, option(5) is the most appropriate answer.