

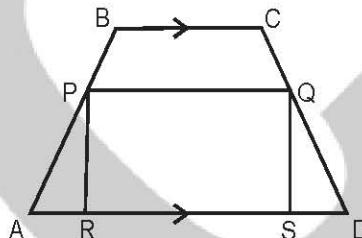
**Mock CAT 2014 - 11**

## **Section I: QA & DI**

4. A function  $f$  is even if  $f(t) = f(-t)$ , and it is odd if  $f(t) = -f(-t)$ . Let  $f(x) = g(x) + h(x)$  and  $f(-x) = g(x) - h(x)$ . Which of the following is definitely correct?
- $f$  is an even function and  $g$  is an odd function.
  - Both  $f$  and  $g$  are even functions.
  - (c)  $f$  is an even function and  $h$  is an odd function.**
  - $g$  is an even function and  $h$  is an odd function.

4. c  $f(x) = g(x) + h(x)$  ... (i)  
 or  $f(-x) = g(-x) + h(-x)$  ... (ii) (substituting  $x = -x$  in (i))  
 And  $f(-x) = g(x) - h(x)$  ... (iii)  
 Or  $f(x) = g(-x) - h(x)$  ... (iv) (substituting  $x = -x$  in (iii))  
 Adding (i) and (iv),  $2f(x) = g(x) + g(-x)$   
 Now adding (ii) and (iii),  $2f(-x) = g(x) + g(-x)$   
 So  $f(x) = f(-x)$ . Therefore  $f$  is an even function.  
 Subtracting (iv) from (i),  $0 = g(x) - g(-x) + 2h(x)$   
 Now subtracting (ii) from (iii),  
 $0 = g(x) - g(-x) - 2h(-x)$   
 So  $h(x) = -h(-x)$ . Therefore  $h$  is odd function.  
 We cannot be certain of  $g$ 's nature.

5. In the figure given below, ABCD is an isosceles trapezium and PQSR is a square. If the length of BC, PQ and AD is 2, 3 and 6 units respectively, find the area of trapezium ABCD.



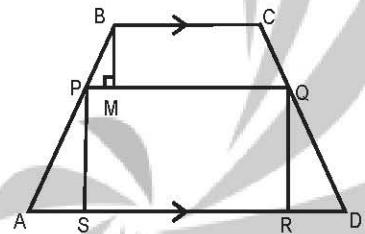
(a) 14 sq. units

(b) 12 sq. units

**(c) 16 sq. units**

(d) 18 sq. units

5. c



Drop a perpendicular from point B on PQ.

∴ ABCD is an isosceles trapezium, therefore AS = RD.

$$\Rightarrow AS = RD = \frac{AD - PQ}{2} = \frac{3}{2} \text{ units.}$$

$$\text{Also, } \triangle BMP \sim \triangle PSA \Rightarrow \frac{BM}{MP} = \frac{PS}{SA}$$

$$\Rightarrow BM = \frac{3}{2} \times \left( \frac{PQ - BC}{2} \right)$$

$$\Rightarrow BM = \frac{2 \times 1}{2} = 1 \text{ units}$$

$$\text{Area of trapezium ABCD} = \frac{1}{2} (BC + AD) \times (BM + PS) = \frac{1}{2} \times 8 \times 4 = 16 \text{ sq. units.}$$

6. What is the probability that  $(a \times b)$ , where 'a' and 'b' are natural numbers not more than 6, is a perfect square?

(a)  $\frac{5}{36}$

(b)  $\frac{2}{9}$

(c)  $\frac{7}{36}$

(d)  $\frac{1}{6}$

6. b The only possible perfect squares which can be obtained are 1, 4, 9, 16, 25 and 36.

These perfect squares can be obtained in the following ways:

(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6), (1, 4) and (4, 1)

⇒ Therefore, total of 8 cases.

Hence, required probability =  $\frac{8}{36} = \frac{2}{9}$ .

7. Find the number of integral solutions of the equation  $\frac{x^2}{y} = 4x - 3$ , where x and y are non-zero real numbers.

(a) 0

(b) 1

(c) 2

(d) 3

7. c  $\frac{x^2}{y} = 4x - 3 \Rightarrow x^2 - 4xy + 3y = 0$

$\Rightarrow x = 2y \pm \sqrt{4y^2 - 3y}$

For x to be an integer  $4y^2 - 3y$  should be the perfect square of an integer.

$4y^2 - 3y = k^2 \Rightarrow y = \frac{3 \pm \sqrt{16k^2 + 9}}{8}$ , where k is an integer.

∴  $16k^2 + 9 = m^2$ , where m is an integer.

$\Rightarrow (4k - m)(4k + m) = -9$ .

The only permissible values of k and m are 1 and  $\pm 1$  respectively.

Thus, the only possible value of k for which y is an integer is k = 1.

$\Rightarrow y = \frac{3+5}{8} = 1$

$\Rightarrow x = 2 \pm \sqrt{1} = 1, 3$ .

8. What is the remainder when  $[7!]^k$ , where  $k = 1 + 2^2 + 2^3 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 + 2^9 + 2^{10}$ , is divided by 76?

(a) 36

(b) 12

(c) 44

(d) 8

8. c  $7! = 5040$

$$\frac{[7!]^k}{76} = \frac{[5040]^k}{76} = \frac{[5040 \times (5040)^{k-1}]}{76} = \frac{[1260 \times (5040)^{k-1}]}{19}$$

Remainder when  $5040^{(k-1)}$  divided by 19:

$$\frac{5040^{(k-1)}}{19} = \frac{[(5035 + 5)^{(k-1)}]}{19}$$

5035 is a multiple of 19. So the net remainder is when  $5^{(k-1)}$  is divided by 19.

$(k-1) = 2^2 + 2^3 + 2^4 + \dots + 2^9 + 2^{10} = 4(1 + 2 + 2^2 + 2^3 + \dots + 2^7 + 2^8) = 4m$ , where 'm' = 511.

$$\frac{5^{4m}}{19} = \frac{625^m}{19} = \frac{(627-2)^m}{19} = \frac{-2^m}{19} = \frac{-2^{511}}{9} = \frac{-[(2)^7 \times (512)^{56}]}{19} = \frac{-[(128) \times (513-1)^{56}]}{19}$$

Now 513 is a multiple of 19. 128, when divided by 19, leaves a remainder of 14.

Therefore, when  $5^{4m}$  is divided by 19, the remainder = 5.

Remainder when 1260 is divided by 19 = 6.

$$6 \times 5 = 30.$$

So, remainder when  $[1260 \times (5040)^{k-1}]$  is divided by 19 is 11.

Since we have cancelled a common factor of 4 from the numerator and denominator, the net remainder =  $11 \times 4 = 44$ .

#### **Alternate method:**

$$7! = 5040$$

$$\text{Let } P = \text{Rem}\left(\frac{[7!]^k}{76}\right) = \text{Rem}\left(\frac{[5040]^k}{76}\right) = \text{Rem}\left(\frac{[5040 \times (5040)^{k-1}]}{76}\right)$$

$$= 4 \times \text{Rem}\left(\frac{[1260 \times (5040)^{k-1}]}{19}\right) = 4 \times \left\{6 \times \text{Rem}\left(\frac{(5040)^{2044}}{19}\right)\right\},$$

(Where  $k = (1 + 2^2 + 2^3 + \dots + 2^{10}) = (2 + 2^2 + 2^3 + \dots + 2^{10}) - 1 = 2^{11} - 2 - 1 = 2045$ .)

5040 and 19 are coprime, by Euler's Theorem,

$$\text{Rem}\left(\frac{(5040)^{18}}{19}\right) = 1.$$

$$\therefore P = 4 \times \left\{ 6 \times \text{Rem} \left( \frac{(5040^{18})^{113} \times 5040^{10}}{19} \right) \right\} = 4 \times \left\{ 6 \times 1 \times \text{Rem} \left( \frac{5040^{10}}{19} \right) \right\} = 4 \times \left\{ 6 \times \text{Rem} \left( \frac{5^{10}}{19} \right) \right\}$$

$$= 4 \times \left\{ \text{Rem} \left( \frac{6 \times -2 \times -2 \times 6}{19} \right) \right\} = 4 \times \left\{ \text{Rem} \left( \frac{6 \times 4 \times 6}{19} \right) \right\} = 4 \times \left\{ \text{Rem} \left( \frac{6 \times 4 \times 6}{19} \right) \right\} = 4 \times \left\{ \text{Rem} \left( \frac{144}{19} \right) \right\} = 4 \times 11 = 44.$$

9. The product of two numbers, whose H.C.F. is 36, is 1260. How many such pairs of numbers are possible?



9. a Let the numbers be  $36a$  and  $36b$ , where  $a, b \in \mathbb{N}$ .  
 $\Rightarrow 36a \times 36b = 1260$

$\Rightarrow a \times b = \frac{35}{36}$ , which is not possible.

10. If  $\frac{(a+1)^2 + (b+1)^2 + (c+1)^2}{a+b+c} = 4$ , what is the value of  $\left(a+\frac{1}{b}-1\right)\left(b+\frac{1}{c}-1\right)\left(c+\frac{1}{a}-1\right)$ ?  
 (a) 0      (b) 1      (c) 8      (d) 27

- $$10. \text{ b} \quad (a+1)^2 + (b+1)^2 + (c+1)^2 = 4(a+b+c)$$

$$\Rightarrow (a - 1)^2 + (b - 1)^2 + (c - 1)^2 = 0$$

$$\Rightarrow a = b = c = 1$$

$$\text{Hence, } \left( a + \frac{1}{b} - 1 \right) \left( b + \frac{1}{c} - 1 \right) \left( c + \frac{1}{a} - 1 \right) = 1 \times 1 \times 1 = 1.$$

**Directions for questions 11 and 12:** Answer the questions on the basis of the information given below.

The following chart shows the results of an experiment conducted to check the presence of Ca, Mg and P ions in 6 different brands of toothpastes. The following table shows the quantity used for conducting the experiment, amount of Ca, Mg and P ions present, and the recommended quantity of toothpaste to be used per brushing for each of the six types of toothpaste.

Toothpaste	Quantity used (in grams)	Ca ions (in mg)	Mg ions (in mg)	P ions (in mg)	Recommended use per brushing (in grams)
Colgate	200	24	8	32	1.25
Pepsodent	100	10	6	14	1.00
Babool	300	27	18	40	1.60
Promise	200	22	11	27	1.40
Sensoform	100	11	5	13	0.80
Close-up	200	25	9	24	1.10

Based on the experiment results, toothpastes were categorised as follows:

Excellent	If percentage of Ca ions is the highest and percentage of Mg ions is the least as compared to other toothpastes
Good	If percentage of Ca ions is the highest and percentage of P ions is the least as compared to other toothpastes
Average	If percentage of P ions is the highest and percentage of Mg ions is the least as compared to other toothpastes
Poor	If percentage of Mg ions is the highest and percentage of Ca ions is the least as compared to other toothpastes

It is known that 1 grams = 1000 mg.

13. If  $(a + b + c)(b + c - a) = (c + a - b)(a + b - c)$ , where a, b and c are the sides of a triangle, which of the following represents the area of the triangle?

(a)  $\frac{1}{4}(a + b - c)(a + b + c)$

(b)  $\frac{1}{4}(a - b + c)(a + b + c)$

(c)  $\frac{1}{4}(b + c - a)(a + b + c)$

(d)  $\frac{1}{4}(b + c - a)(a + b - c)$

13. c Semi-perimeter of a triangle is represented as 's' where

$$s = \frac{a + b + c}{2}$$

Therefore  $(a + b + c) = 2s$ ,

Also,  $(b + c - a) = (2s - 2a)$ ,  $(c + a - b) = (2s - 2b)$  and

$(a + b - c) = (2s - 2c)$

It is given that,  $(a + b + c)(b + c - a) = (c + a - b)(a + b - c)$

Or,  $2s(2s - 2a) = (2s - 2b)(2s - 2c)$

Or,  $4s(s - a) = 4(s - b)(s - c)$

Or,  $s(s - a) = (s - b)(s - c)$

We know that area of a triangle  $A = \sqrt{s(s-a)(s-b)(s-c)}$

Here,  $s(s - a) = (s - b)(s - c)$

$$\therefore A = \sqrt{[s(s-a)]^2} = s(s-a)$$

$$= \frac{1}{4}[2s(2s - 2a)] = \frac{1}{4}(a + b + c)(b + c - a).$$

14. The value of the expression  $\left(\frac{y^m}{y^n}\right)^{\frac{1}{mn}} \cdot \left(\frac{y^n}{y^p}\right)^{\frac{1}{np}} \cdot \left(\frac{y^p}{y^m}\right)^{\frac{1}{mp}}$  is

(a) 1

(b)  $y^{\frac{1}{mnp}}$

(c)  $y^{mn + np + pm}$

(d) None of these

14. a  $y^{\left(\frac{m-n}{mn}\right)} \cdot y^{\left(\frac{n-p}{np}\right)} \cdot y^{\left(\frac{p-m}{mp}\right)}$

$$= y^{\frac{1}{n-m}} y^{\frac{1}{p-n}} y^{\frac{1}{m-p}} = y^0 = 1.$$

15. If P be the product of all the natural numbers between 45 and 293 that have an odd number of factors, what is the highest power of 12 in P?

(a) 9

(b) 5

(c) 7

(d) 8

15. d Only perfect squares have odd number of factors

$$\therefore P = 49 \times 64 \times 81 \times 100 \times 121 \times 144 \times 169 \times 196 \times 225 \times 256 \times 289.$$

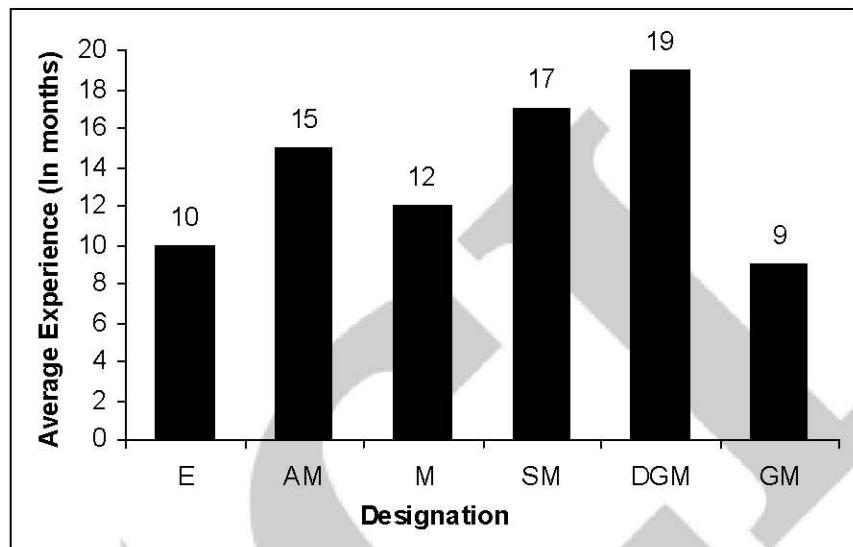
$$\Rightarrow P = 2^{6+2+4+2+8} \times 3^8 \times N, \text{ where } N \text{ is neither a multiple of 2 nor a multiple of 3.}$$

For powers of 12 check the powers of 3 and 4.

Here highest power of 3 is 8, and highest power of 4 is 11. Thus, the highest power of 12 is  $\min(8, 11) = 8$ .

**Directions for questions 16 and 17:** Answer the questions on the basis of the information given below.

Each of employees working in XYZ Ltd. holds exactly one of the designation out of six designations namely Executive (E), Assistant Manager (AM), Manager (M), Senior Manager(SM), Deputy General Manager (DGM) and General Manager (GM). The following bar graph provides information about the average experience of employees across the six designations.



The following table gives the number of employees with experience less or more than the average experience of employees across the six designations. The average experience of employees with experience less or more than the average experience of employees for each of the six designations is an integer.

	Number of Employees	
	Less than the Average Experience	More than the Average Experience
E	16	28
AM	10	12
M	24	10
SM	8	16
DGM	4	10
GM	8	2



16. a Let 'x' and 'y' be the average experience of Executives whose experience is less and more than the average experience of all the executives.

$$16x + 28y = 10(16 + 28) = 440.$$

$$\Rightarrow 4x + 7y = 110.$$

Since  $x < 10 < y$ , the only value

Required difference =  $28 \times 14 - 16 \times 3 = 344$ .

Required references: 20-41-10-3-311



20. a It can be observed that,

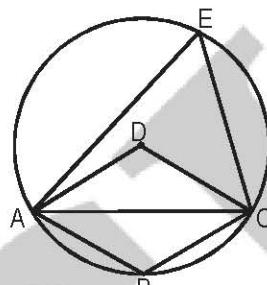
$$(ax^2 + by^2)(x + y) - (ax + by)xy = (ax^3 + by^3 + ax^2y + bxy^2) - (ax^2y + bxy^2) = ax^3 + by^3$$

Substituting given values, we get,

$$2(x + y) - 4xy = -3$$

$$\text{Thus, } (2x - 1)(2y - 1) = 4xy - 2(x + y) + 1 = 4.$$

21. In the figure given below, ABCD is a rhombus, and D is the center of the circle. What is the measure of  $\angle AEC$ ?



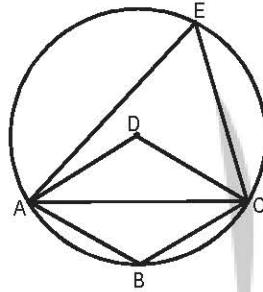
(a)  $45^\circ$

(b)  $50^\circ$

(c)  $60^\circ$

(d)  $70^\circ$

21. c



By the problem, ABCD is a rhombus.

$$\Rightarrow \angle ADC = \angle ABC.$$

Let  $\angle AEX = x^\circ$ .

$$\Rightarrow \angle ADC = 2x^\circ \dots (\text{angle subtended at center} = \text{twice angle subtended at circumference})$$

$$\text{and } \angle ABC = (180 - x)^\circ \dots (\text{ABCE is a cyclic quadrilateral})$$

$$\therefore 2x^\circ = (180 - x)^\circ$$

$$\Rightarrow \angle AEC = x^\circ = 60^\circ.$$

22. If  $a_n = x^n + \frac{1}{x^n}$ , where 'n' a natural number, then  $a_{n+3} =$

(a)  $a_1 \cdot a_{n+2} - a_{n+1}$

(b)  $a_1 \cdot a_{n+2} - a_{n+1} + a_n$

(c)  $a_1 \cdot a_{n+2} - a_{n+1} - a_n$

(d)  $a_n \cdot a_{n+2} - a_{n+1}$

22. a  $\because a_1 \cdot a_{n+2}$  exists in all options.

$\therefore$  We will calculate it first.

$$a_1 \cdot a_{n+2} = \left( x + \frac{1}{x} \right) \left( x^{n+2} + \frac{1}{x^{n+2}} \right) = x^{n+3} + \frac{1}{x^{n+3}} + x^{n+1} + \frac{1}{x^{n+1}}$$

$$\Rightarrow a_1 \cdot a_{n+2} = a_{n+3} + a_{n+1}$$

$$\Rightarrow a_{n+3} = a_1 \cdot a_{n+2} - a_{n+1}$$

**Directions for questions 23 to 26:** Answer the questions on the basis of the information given below.

The table given below shows the data related to the average marks scored by boys and girls in primary and secondary classes of a school during the period 1996-2002. It also gives the average marks of all the boys and girls, studying in primary and secondary classes for the same period.

Years	Primary		Secondary		Total	
	Boys	Girls	Boys	Girls	Boys	Girls
1996	40	54	54	62	48	58
1997	72	80	60	68	64	72
1998	60	76	68	70	62	74
1999	94	96	90	98	92	97
2000	58	60	76	80	64	62
2001	50	60	80	90	70	76
2002	64	80	76	90	70	84

23. In 1996, which of the following could be the total number of boys studying in either primary or secondary classes of the school?



23. a Let the number of boys in primary and secondary class be  $b_1$  and  $b_2$ .

$$\Rightarrow 40 \times b_1 + 54 \times b_2 = 48 \times (b_1 + b_2) \Rightarrow \frac{b_1}{b_2} = \frac{3}{4}$$

Thus,  $b_1 + b_2$  should be a multiple of 7 and the only possible option is (a) i.e. 14.

24. Which of the following statements is definitely true?

- (a) The total number of boys in the years 1997 and 1998, put together, was greater than the total number of girls in the years 1998 and 1999, put together.

- (b) The total number of boys in all the given years, put together, was greater than the total number of girls in the years 1997 and 1998, put together.

- (c) The total number of students in primary classes in the years 1996 and 1997, put together, was greater than the total number of students in secondary classes in the years 1996 and 1997, put together.

- (d) None of these.

24. c To see which of the statements is definitely true, we have to check each and every option one by one.

**Option (a):** Let the number of boys in primary and secondary class in the year 1997 be  $b_1$  and  $b_2$  respectively and in the year 1998 be  $b_3$  and  $b_4$ .

Similarly, the girls for the same be  $g_1, g_2, g_3$  and  $g_4$ .

From the given table, we can only find the values of  $\frac{b_1}{b_2}$ ,  $\frac{b_3}{b_2}$ ,  $\frac{g_1}{g_2}$  and  $\frac{g_3}{g_2}$ , but there is no way to find the value of  $(b_1 + b_3)$ .

+  $b_3 + b_4$ ) or ( $g_1 + g_2 + g_3 + g_4$ ) or to compare these two quantities.  
Using this, one can find out the total number of bars and total number of sides in the given shapes.

**Option (b):** With the same logic applied in option (a) we cannot say anything about the total number of boys for all the years and the total number of girls for all the years put together.

**Option (c):** With the same convention used in option (a) for the years 1997 and 1998, we assume the same for the years 1996 and 1997, respectively.

$$\Rightarrow \frac{b_1}{b} = \frac{3}{4}, \frac{b_3}{b} = \frac{1}{2}, \frac{g_1}{g} = \frac{1}{1} \text{ and } \frac{g_3}{g} = \frac{1}{2}$$

$\Rightarrow b_1 < b_2$ ;  $b_3 < b_4$ ;  $g_1 = g_2$  and  $g_3 < g_4$   
 $\Rightarrow b_1 + b_3 + g_1 + g_3 < b_2 + b_4 + g_2 + g_4$   
 Hence, statement in option (c) is definitely true.

25. If the average marks score by all the students in the years 2000 and 2001 was 63 and 72 respectively, and the number of boys studying in secondary classes in the year 2000 was equal to the number of boys studying in the primary classes in the year 2001, then which of the following statements is definitely true?
- (a) The total number of students in 2000 was equal to that in 2001.
  - (b) The total number of students in 2000 was 40% more than the total number of students in 2001.
  - (c) The total number of students in 2000 was 20% less than the total number of students in 2001.
  - (d) The total number of students in 2000 was 33.33% more than the total number of students in 2001.**

25. d Let the number of boys in primary and secondary class in the year 2000 be  $B_1$  and  $B_2$  respectively and in the year 2001 be  $B_3$  and  $B_4$  respectively.

Similarly, the number of girls in primary and secondary class in the year 2000 be  $G_1$  and  $G_2$  respectively and in the year 2001 be  $G_3$  and  $G_4$  respectively.

In 2000:

$$58B_1 + 76B_2 = 64(B_1 + B_2) \Rightarrow 2B_2 = B_1$$

$$60G_1 + 80G_2 = 62(G_1 + G_2) \Rightarrow 9G_2 = G_1$$

$$64(B_1 + B_2) + 62(G_1 + G_2) = 63(B_1 + B_2 + G_1 + G_2)$$

$$\Rightarrow B_1 + B_2 = G_1 + G_2$$

$$\begin{aligned} \text{Total number of students in 2000} &= B_1 + G_1 + B_2 + G_2 \\ &= 6B_2 \end{aligned}$$

Following the same logic as in the year 2000 for the year 2001:

$$\text{Total number of students in 2001} = B_3 + G_3 + B_4 + G_4$$

$$= \frac{9B_3}{2}$$

Given that the number of boys studying in secondary classes in the year 2000 is equal to the number of boys studying in the primary classes in the year 2001.

$$\Rightarrow B_2 = B_3$$

$$\therefore \frac{\text{Total number of students in 2000}}{\text{Total number of students in 2001}} = \frac{6B_2}{\frac{9B_3}{2}} = \frac{12}{9} = \frac{4}{3}$$

Therefore, the total number of students in 2000 is 33.33% more than the total number of students in 2001.

26. If the average marks of all the students in 2002 was 80 and the number of boys in secondary classes was 500, then the total number of students in 2002 was

- (a) 4560
- (b) 3620
- (c) 4200
- (d) 3500**

26. d Let the number of boys in the primary and in the secondary classes in the year 2002 be 'x' and 'y' respectively. Let the number of girls in the primary and in the secondary classes in the year 2002 be 'z' and 'w' respectively.

For boys:  $64x + 76y = 70(x + y) \Rightarrow x = y$

For girls:  $80z + 90w = 84(z + w) \Rightarrow 2z = 3w$

For all the boys and girls:

$$70(x + y) + 84(z + w) = 80(x + y + z + w)$$

$$\Rightarrow 2(z + w) = 5(x + y) = 10x \Rightarrow 3w + 2w = 10x$$

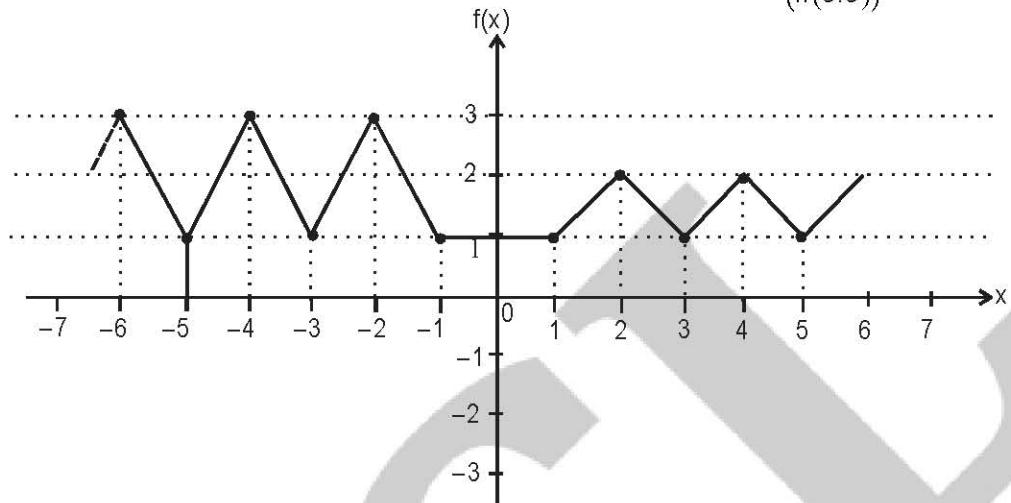
$$\Rightarrow w = 2x \text{ and } z = 3x$$

Given that  $y = 500$ .

Therefore,  $x = 500$ ,  $z = 1500$  and  $w = 1000$ .

Total number of students in the primary and in the secondary classes in the year 2002 =  $x + y + z + w = 3500$ .

27. The following figure shows the graph of a real function  $f(x)$ . Another two real functions  $g(x)$  and  $h(x)$  are defined as  $g(x) = f(f(x))$  and  $h(x) = g(g(x))$ . Find the value of  $\frac{g(-2.5) \times g(-3.5)}{(h(5.5))^2}$ .



(a)  $\frac{16}{9}$

(b) 1

(c)  $\frac{4}{9}$

(d)  $\frac{9}{16}$

27. a  $g(-2.5) = f\{f(-2.5)\} = f(2) = 2$

$g(-3.5) = f\{f(-3.5)\} = f(2) = 2$   $h(5.5) = g\{g(5.5)\} = g\{f(f(5.5))\} = g\{f(1.5)\} = g(1.5)$

$$f(f(1.5)) = f(1.5) = 1.5 \Rightarrow \frac{g(-2.5) \times g(-3.5)}{(h(5.5))^2} = \frac{2 \times 2}{1.5 \times 1.5} = \frac{16}{9}$$

28. Which of the following values of  $x$  satisfies the inequality  $64^{\frac{2-3x}{6}} - 14 \times 4^{-x} + 12 \times 2^{-x} < 0$ , where 'x' is a real number?

(a)  $\log_{0.5} 2.2$

(b)  $\log_{0.5} 1.8$

(c)  $\log_{0.5} 1.2$

(d)  $\log_{0.5} 1.4$

28. b  $64^{\frac{2-3x}{6}} - 14 \times 4^{-x} + 12 \times 2^{-x} < 0$

$$\Rightarrow (64)^{\frac{x}{2}} \times (64)^{\frac{1}{3}} - 14 \times (4)^{-x} + 12 \times (2)^{-x} < 0 \Rightarrow (8^{-x}) \times 4 - 14(2^{-2x}) + 12(2^{-x}) < 0$$

$$\Rightarrow 4 \times (2^{-x})^3 - 14 \times (2^{-x})^2 + 12 \times (2^{-x}) < 0 \Rightarrow 2^{-x} \{4 \times (2^{-x})^2 - 14 \times 2^{-x} + 12\} < 0$$

$2^{-x}$  is always positive

$$\Rightarrow 4 \times (2^{-x})^2 - 14 \cdot 2^{-x} + 12 < 0$$

Let  $2^{-x} = t$

$$\Rightarrow 4t^2 - 14t + 12 < 0$$

$$\text{or } (t-2)\left(t-\frac{3}{2}\right) < 0 \Rightarrow \frac{3}{2} < t < 2 \text{ or } \frac{3}{2} < 2^{-x} < 2 \Rightarrow \frac{3}{2} < \left(\frac{1}{2}\right)^x < 2 \Rightarrow \log_{0.5} 2 < x < \log_{0.5} 1.5$$

Only option (b) is correct.

29. Two years ago, the sum of annual incomes of Roshan and his four brothers A, B, C and D was Rs.1,18,000. Two years hence, the sum of annual incomes of Roshan and the two brothers A and D will be Rs.1,00,000. The present annual incomes, in the given order, of A, B, C and D are in an Arithmetic Progression, with a common difference of Rs.2,000. If the annual income of Roshan, along with each of his four brothers, increases by Rs.1,000 every year find the present annual income of A.

(a) Rs.18,000      (b) Rs.20,000      (c) Rs.16,000      (d) **Rs.14,000**

29. d Let us assume the incomes of Roshan and the average income of his 4 brothers A, B, C and D, two years ago were x and y respectively.

$$\therefore x + 4y = 118000 \quad \dots(i)$$

If  $I_A$ ,  $I_B$ ,  $I_C$  and  $I_D$  denote the incomes of A, B, C and D, two years ago, then,  
 $I_A + I_D = I_B + I_C = 2y$

It is also given that sum of Roshan's income along with brother A and D will be 100,000 after 2 years from now. As the incomes of the four brothers A, B, C and D are in arithmetic progression with the common difference of Rs.2,000, so two years from now the sum of incomes of brothers A and D will be Rs.(2y + 4000 + 4000) as the income increases by Rs.1000 every year.

$$\therefore (x + 4000) + 2(y + 4000) = 100000 \quad \dots(ii)$$

Solving equation (i) and (ii), we get  
 $x = \text{Rs. } 58,000$  and  $y = \text{Rs. } 15,000$ .

So, the present average income of A, B, C and D is Rs.17,000.

$\Rightarrow$  The present incomes of A, B, C and D are  
(14,000, 16,000, 18,000, 20,000).

30. In the X-Y plane, what is the area of the region bounded by the following two curves?

$$f(x) = \max(x - 1, 1 - x) - 1 \text{ and } g(x) = \min(x + 2, -2 - x) + 3$$

(a) 2 sq. units      (b) 2.5 sq. units      (c) 3 sq. units      (d) **3.5 sq. units**

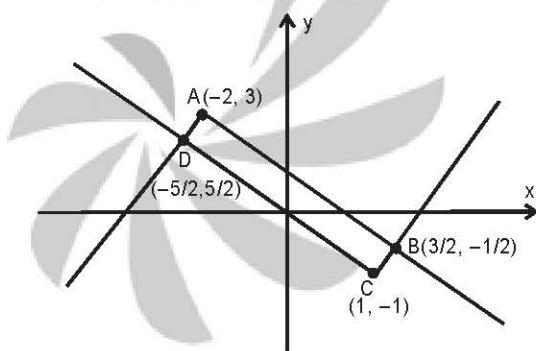
30. d  $\max(x - 1, 1 - x) = |x - 1|$

and  $\min(x + 2, -2 - x) = -|x + 2|$

Thus,  $f(x) + 1 = |x - 1|$

and  $g(x) - 3 = -|x + 2|$

Drawing the graphs of  $f(x)$  and  $g(x)$  in the X-Y plane;



The bounded region ABCD, is a rectangle.

$$AB = CD = \frac{7}{\sqrt{2}} \text{ units} \quad \text{and} \quad BC = AD = \frac{1}{\sqrt{2}} \text{ units}$$

$$\text{Area} = \left(\frac{7}{\sqrt{2}}\right) \times \left(\frac{1}{\sqrt{2}}\right) \text{ sq. units} = 3.5 \text{ sq. units.}$$

31. Raman planted two climbers A and B at the same spot at the bottom of a 30 metres high cylindrical pillar, whose radius is 1 metre. When he came back after a year, he found that the climber A had climbed the pillar by completing 5 uniform spirals in the clockwise direction and climber B did the same in 3 uniform spirals in the anti-clockwise direction. What is the height (in metres) at which paths of climbers A and B cross each other for the first time?

(a) 3.6

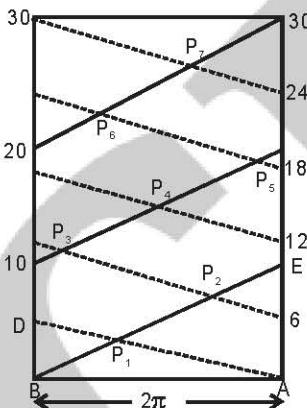
(b) 3.5

(c) 4.25

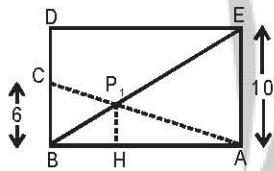
**(d) 3.75**

**For question 31:** Climber A, shown in dotted line, has made 5 uniform spirals in the clockwise direction whereas climber B, shown in bold line has made 3 uniform spirals in the anti-clockwise direction.

As given below in the figure the rectangular cross section of the cylindrical pillar. As we can observe, paths of both the climbers cross each other at 7 points.



31. d Figure given below shows the first crossing point of the paths of climbers A and B at  $P_1$ . The height is  $P_1H$ .



Now from right angled triangle, ABC

$$AC = \sqrt{(6)^2 + (2\pi)^2} = 8.7 \text{ metres}$$

Triangles  $BCP_1$  and  $AP_1E$  are similar.

$$\therefore \frac{BC}{EA} = \frac{CP_1}{AP_1}$$

or

$$CP_1 = \frac{6}{6+10} \times 8.7 = 3.26 \text{ metres and } AP_1 = 5.44 \text{ metres}$$

Triangles  $AP_1H$  and  $ABC$  are also similar

$$\therefore \frac{P_1H}{BC} = \frac{AP_1}{AC}$$

$$\text{or } P_1H = 3.75 \text{ metres}$$

#### Alternate method:

This scenario is similar to 2 runners running, in opposite directions, around a circular track. The question asks for the distance travelled when the two meet for the first time.

$$\text{The required distance} = \frac{30}{5+3} = 3.75 \text{m.}$$

32. Suresh and Ramesh decide to play a game with a fair die marked with numbers 1, 2, 3, 4, 5 and 6 on its six faces. In the game, each player rolls the die and notes the number obtained. They roll the die turn by turn. The player who first gets 6 wins the game. If Suresh starts the game, then the probability of Ramesh winning the game is

(a)  $\frac{1}{6}$

(b)  $\frac{5}{6}$

(c)  $\frac{6}{11}$

(d)  $\frac{5}{11}$

32. d Ramesh gets the second, fourth, sixth.... infinite turns to roll the die. The probability that he is the first to get number 6 as his outcome is given by:

$$P(\text{Ramesh Wins}) = \left(\frac{5}{6} \times \frac{1}{6}\right) + \left(\frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{1}{6}\right) + \left(\frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{5}{6} \times \frac{1}{6}\right) + \dots \infty = \frac{\left(\frac{5}{6} \times \frac{1}{6}\right)}{1 - \left(\frac{5}{6} \times \frac{5}{6}\right)} = \frac{5}{11}.$$

33. In  $\triangle ABC$ , G is the orthocentre and D is the midpoint of BC. The area of  $\triangle ABC$  is five times the area of  $\triangle GDC$ , and  $\angle ABC = 60^\circ$ . If the minimum distance between BC and point A is 10 cm, find the length of GC?

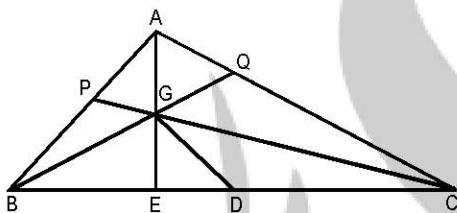
(a)  $\frac{4\sqrt{3}}{3}$  cm

(b) 4 cm

(c) 8 cm

(d)  $\frac{8\sqrt{3}}{3}$  cm

33. c



The figure is as shown above.

Minimum distance between A and BC is the perpendicular distance. If  $AE \perp BC$ , it passes through G and  $AE = 10$  cm.

$$\frac{\text{Area of } (\triangle GDC)}{\text{Area of } (\triangle ABC)} = \frac{1}{5}$$

But Area of  $(\triangle GDC)$  = Area of  $(\triangle GDB)$

$$\Rightarrow \frac{\text{Area of } (\triangle GBC)}{\text{Area of } (\triangle ABC)} = \frac{2}{5}$$

Both the triangles ( $\triangle GBC$  and  $\triangle ABC$ ) are on the same base BC.

$$\Rightarrow \frac{\frac{1}{2} \times BC \times GE}{\frac{1}{2} \times BC \times AE} = \frac{2}{5} \Rightarrow \frac{GE}{AE} = \frac{2}{5}$$

$$\Rightarrow GE = \frac{2}{5} \times 10 = 4 \text{ cm}$$

Now in  $\triangle CPB$ ,

$\angle CPB = 90^\circ$

$\angle PBC = 60^\circ$

$\Rightarrow \angle BCP = 30^\circ$

So in right angled  $\triangle GEC$ ,

$GE = 4$  cm and  $\angle ECG = 30^\circ$

$$\Rightarrow GC = \frac{GE}{\sin \angle ECG} = \frac{4}{\sin 30^\circ} = 8 \text{ cm.}$$

$$34. \text{d} \quad \log_{x(6-x)}(x^2 - 5x) = \log_{x(6-x)} 6$$

$$\Rightarrow x^2 - 5x - 6$$

$$\Rightarrow (x - 6)(x + 1) = 0$$

$$\Rightarrow x = 6, -1$$

If  $x = -1$ , then

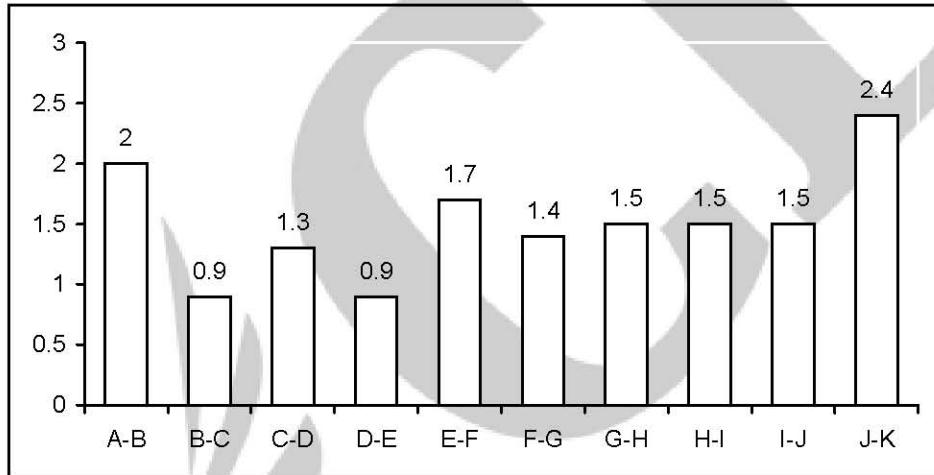
and if  $x = 6$ , then  $x(6 - x) = 0$ .

Both are not possible.

$\therefore$  no value of  $x$  is possible.

**Directions for questions 35 to 38:** Answer the questions on the basis of the information given below:

A bus starts from terminus A and terminates its journey at K. It stops at 9 intermediate bus stops between A and K viz. at B, C, D, E, F, G, H, I and J. Bus is the only mode of transportation available. The bar chart given below shows the distance (in km) between some pairs of bus stops.



The details related to the fare, which is determined on the basis of distance or the number of intermediate bus stops (excluding the boarding stop and destination stop) is given in the tables below.

In case of a round trip, a person can travel from A to K and then from K to A without terminating his journey at K. In that case K will be considered only as an intermediate bus stop.

<b>Distance (kms.)</b>	<b>Fare (Rs.)</b>
0 to 4	3
Above 4 till 7	5
Above 7 till 10	8
Above 10 till 12	10
Above 12	16

No. of Intermediate Bus stops	Fare (Rs.)
0 - 2	3
3 - 5	5
6 - 8	8
9 - 11	14
11+	16

Fare policy is such that the fare increases according to increasing distance or increasing number of bus stops, whichever increases the fare by a larger amount. For example, if the distance covered by travelling 2 bus stops is 5 km then fare charged will be according to the distance i.e. Rs. 5. On the other hand, if for travelling 2 km the number of bus stops covered is 5 then the fare will be charged according to the number of bus stops. Anyone buying a ticket of any denomination makes full utilisation of the ticket and gets down at the point beyond which the ticket would not be valid or the bus reaches its terminus. In addition to the information given above, a person trying to minimise or maximise the fare paid, can change any number of buses.

35. What can be the minimum possible fare in which one can reach K from A?  
(a) Rs. 14      (b) Rs. 11      (c) **Rs. 13**      (d) Rs. 12

35. c Minimum possible fare is Rs.13.  
This is possible in various ways. One such example is  
From A to F = Rs.5  
From F to J = Rs.5  
From J to K = Rs.3

36. If a person has Rs. 5 with him, then what can be the maximum possible number of intermediate bus stops and the minimum possible number of intermediate bus stops respectively that he can pass through while travelling from A to K?  
(a) 4, 3      (b) 2, 1      (c) 1, 0      (d) **4, 2**

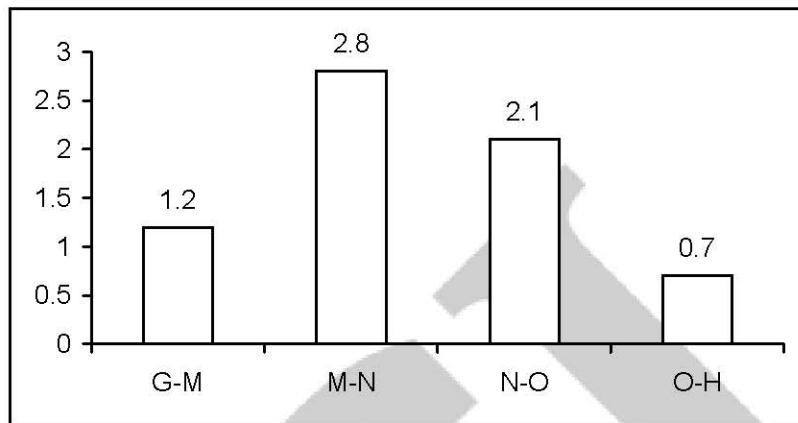
36. d Maximum number of bus stops that can be travelled in Rs.5 = 4 (for example A-F, C-H or D-I)  
Minimum number of bus stops that can be travelled in Rs.5 = 2 (from H-K).

37. Government offers a scheme on the 67th 'Independence Day' in which a person can take a round trip from A to K and then from K to A without terminating at K with a single ticket costing Rs. 16 and fare charges remain as given. What is the difference between the maximum possible fare paid (with atleast one intermediate stop for each sub-journey) to the minimum possible fare paid for the round trip? [Note: while travelling from A to K, A to F is an example of a sub-journey]  
(a) Rs. 18      (b) Rs. 16      (c) **Rs. 14**      (d) Rs. 17

37. c If journey from A-K and from K-A is considered and fare charges remain as given then maximum fare that can be paid = Rs.30. It is possible in the following manner:  
From A to C = Rs.3  
From C to E = Rs.3  
From E to G = Rs.3  
From G to I = Rs.3  
From I to K = Rs.3  
From K to I = Rs.3  
From I to G = Rs.3  
From G to E = Rs.3  
From E to C = Rs.3  
From C to A = Rs.3  
Minimum fare for the round trip = Rs.16 (for person taking just one ticket from A)  
Thus, the required difference is  $30 - 16 = \text{Rs } 14$

**Additional information for question 38:**

Due to some construction work, road between G to H is closed. Thus, buses reach H from G via route GMNOH. The distance (in km) between different bus stops in the new route is shown in the graph given below:



38. What is the ratio of the minimum possible fare to travel from B to I previously to the maximum possible fare to travel from C to J now (with atleast one intermediate stop for each sub-journey while travelling from C to J)? [Note: while travelling from A to K, A to F is an example of a sub-journey]
- (a) 8 : 15      (b) 2 : 9      (c) 1 : 3      (d) 4 : 9

38. a Minimum fare previously required to travel from B to I = Rs.8 (to take ticket of Rs.8 from B to I or to take Rs. 5 ticket from B to G and then Rs. 3 ticket from G to I)

Maximum fare now to travel from C to J = Rs.15. It is possible in the following manner:

From C to E = Rs.3  
From E to G = Rs.3  
From G to N = Rs.3  
From N to H = Rs.3  
From H to J = Rs.3

Hence, the required ratio is 8 : 15.

39. The average of 15 whole numbers is  $5\frac{1}{3}$  when rounded off to the nearest integer. How many minimum pairs of numbers, out of the 15 numbers, are there in which both the numbers are the same?
- (a) 2      (b) 3      (c) 5      (d) Cannot be determined

39. a To have minimum number of pairs, we should take as many distinct and minimum values as possible.

0 ↓ + 1 ↓ + 2 ↓ + 3 ↓ + 4 ↓ + 5 ↓ + 6 ↓ + 7 ↓ + 8 ↓ + 9 ↓ + 10 ↓ + 11 ↓ + 12 ↓ + 0 ↓ + 2 ↓  
 1st    2nd    3rd    4th    5th    6th    7th    8th    9th    10th    11th    12th    13th    14th    15th  
 So, 1st = 14th and 3rd = 15th  
 Hence minimum 2 pairs.

40. Find the value of the following expression:

$$\sqrt{a + \sqrt{a^3 + \sqrt{a^7 + \sqrt{a^{15} + \dots}}}}, \text{ where } a \geq 0.$$

(a)  $\frac{a + \sqrt{a(a+4)}}{4}$       (b)  $\frac{a - \sqrt{a(a+4)}}{4}$       (c)  $\frac{a + \sqrt{a(a+4)}}{2}$       (d)  $\frac{a - \sqrt{a(a+4)}}{2}$

40. c  $x = \sqrt{a + \sqrt{a^3 + \sqrt{a^7 + \sqrt{a^{15}}}}} \dots$

$$\Rightarrow x^2 = a + \sqrt{a^3 + \sqrt{a^7 + \sqrt{a^{15}} + \dots}} \Rightarrow x^2 = a + a\sqrt{a + \sqrt{a^3 + \sqrt{a^7 + \dots}}} \Rightarrow x^2 = a + ax.$$

$$\Rightarrow x^2 - ax - a = 0 \Rightarrow x = \frac{a + \sqrt{a^2 + 4a}}{2}$$

**Short cut:**

Put  $a = 1$

$$x = \sqrt{1 + \sqrt{1 + \sqrt{1 + \dots}}}$$

$$\Rightarrow x^2 = 1 + x$$

$$\Rightarrow x^2 - x - 1 = 0$$

$$\Rightarrow x = \frac{1 + \sqrt{5}}{2}$$

41. Ralph wants to paint the four walls and the ceiling of his room, which is cuboidal in shape. He wants to find out the cost of paint but he is unable to do so as he does not know the exact dimensions of his room. The only thing he knows is that the length, width and height of his room are in the ratio 5 : 3 : 4. Peter, Ralph's best friend, has a room which is 10% longer, 20% wider and 15% lower in height than Ralph's room. Peter's cost of paint was Rs. 4838.37. If the price of the paint per square unit of area to be used by Ralph is same as that used by Peter, then what would be Ralph's approximate cost of paint for painting his room?

(a) Rs. 3500

(b) Rs. 4000

(c) Rs. 4200

**(d) Rs. 4700**

41. d Lateral surface area of the room =  $2(l + b)h$ .

Surface area of the ceiling =  $l \times b$

$\therefore$  Total area to be painted =  $2(l + b)h + lb$

$l : b : h = 5 : 3 : 4$

$\therefore l = 5x, b = 3x, h = 4x$

Area to be painted in Ralph's room =  $2(5x + 3x)4x + 4x(3x) = 79x^2$

Area to be painted in Peter's room =  $2[1.1(5x) + 1.2(3x)] \times 0.85(4x) + [(1.1)5x \times (1.2)3x]$   
 $= 2 \times 9.1x \times 3.4x + 19.80x^2 = 81.68x^2$  sq. units

Cost of paint for an area of  $81.68x^2$  sq. units = Rs. 4838.37

$$\therefore \text{Cost of paint for an area of } 79x^2 = \frac{79x^2 \times 4838.37}{81.68x^2} \approx 4679.6 \approx 4700.$$

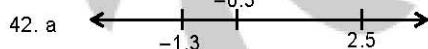
42. Amar, Akbar and Anthony are standing on the x-axis at  $x = -1.3$ ,  $x = 2.5$  and  $x = -0.3$  respectively. Sheila, their mother, is standing at a point P on the x axis, such that the total distance travelled by the three to reach their mother is minimum. What is the difference between the distances travelled by Akbar and Anthony to reach their mother?

**(a) 2.8**

(b) 2.2

(c) 1.6

(d) 1.1



If the point P is at x, then

$$|x - (-1.3)| + |x - (-0.3)| + |x - 2.5| = \text{minimum}$$

$\Rightarrow x = -0.3$  (since it is evident that the mother is standing sum where between Amar and Anthony for the distance to be minimum)

Thus, Akbar does not travel any distance whereas Anthony travels  $|-0.3 - 2.5| = 2.8$  units

$$\therefore \text{Required answer} = 2.8$$

**Note:** Noticing logically, if mother is anywhere distant from  $x = -0.3$ , the distance reduced for one of the three sons will have to be travelled extra by the other two. Hence the sum will be minimum only when  $x = -0.3$ .

43. On the 10 m long roof of a moving bus, Pinky and Pintu were standing at the front and the rear ends, respectively. To meet Pinky, Pintu started walking towards the other end of the roof and met her in 5 seconds. On a particular day, both were sitting at the rear ends of two different buses that were moving, away from each other, on a straight road. When the distance between the two buses was 50 m, Pintu got down from his bus and started chasing Pinky's bus. After running for 100 seconds he reached Pinky's bus. If the speed at which Pintu runs is 7 times the speed at which he walks, at what speed (in km/hr) did the buses run? (Assume all the buses are identical and they move at the same speed.)

(a) 48.6

(b) 45

(c) 60

(d) 48

44. If one of the roots of the equation  $ax^2 + bx + c = 0$  is  $4 + \sqrt{3}$ , then find the sum of the roots of the equation.

(a)  $2\sqrt{3}$

(b) 8

(c) -8

(d) Cannot be determined

For question 43:

Let the walking speed of Pintu =  $x$  m/s,

Walking speed of Pinky =  $y$  m/s and

Speed of a bus =  $V_0$  m/s.

43. a By the problem,

$$x = \frac{10}{5} = 2 \text{ m/s} \quad \text{and} \quad \frac{50}{7x - V_0} = 100$$

$$\Rightarrow V_0 = 13.5 \text{ m/s}$$

$\Rightarrow$  the buses run at 13.5 m/s or at 48.6 km/hr.

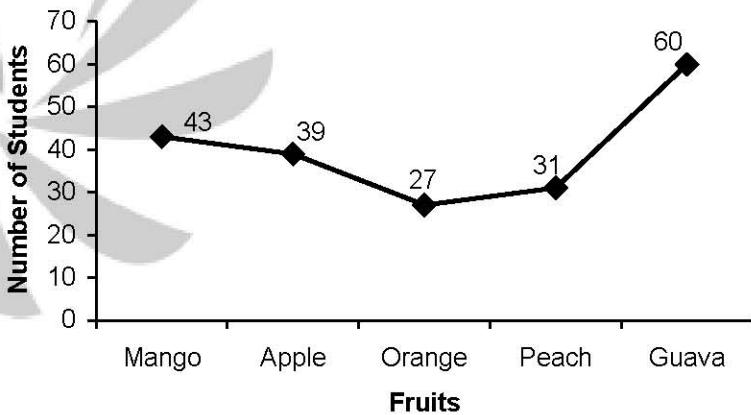
44. d By the problem, one of the roots is  $4 + \sqrt{3}$ .

Thus, the other root could be any real value.

Hence, the sum of the roots cannot be determined.

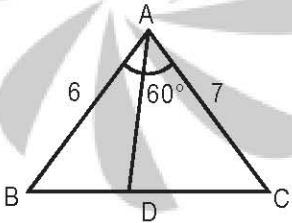
**Directions for questions 45 to 49:** Answer the questions on the basis of the information given below.

In a class of 200 students, 200 fruits, belonging to five different varieties namely Mango, Apple, Orange, Peach and Guava, were distributed such that each student got exactly 1 fruit. The following line graph provides information about the number of students who received a mango, an apple, an orange, a peach and a guava.



The students exchanged the fruits among themselves and after the completion of exchanges, it was noted that no child had the same variety of fruit that he/she had earlier, and each student has exactly one fruit. After the completion of exchanges, the following observations were made:

- Out of the students who initially had a mango, the number of students who ended up with an apple, orange, peach and guava was 8, 11, 13 and 11 respectively.
  - Out of the students who initially had an orange, the number of students who ended up with a mango and an apple was 3 and 16 respectively.
  - Out of the students who initially had a peach, the number of students who ended up with a mango was 8.
  - Out of the students who initially had a guava, the number of students who ended up with a peach was also 8.



In  $\triangle ABC$ ,  $AD$  is angle bisector of  $\angle BAC$  meeting side  $BC$  at  $D$ .  $AB = 6 \text{ cm}$ ,  $AC = 7 \text{ cm}$  and  $\angle BAC = 60^\circ$ . Find the length of side  $AD$ .

- (a)  $\frac{42\sqrt{3}}{26}$       (b)  $\frac{40\sqrt{3}}{13}$       (c)  $\frac{42\sqrt{3}}{13}$       (d)  $\frac{21\sqrt{3}}{13}$

For questions 45 to 49:

	Mango	Apple	Orange	Peach	Guava	Total
Mango	0	8	11	13	11	43
Apple	w	0	z	10 - y	29 + y - w - z	39
Orange	3	16	0	y	8 - y	27
Peach	8	x	11 - w - z - x	0	12 + w + z	31
Guava	32 - w	15 - x	5 + w + x	8	0	60
Total	43	39	27	31	60	

From the table we get the following inequalities:

$$0 \leq w \leq 11$$

$$0 \leq x \leq 11$$

$$0 \leq y \leq 8$$

$$0 \leq z \leq 11$$

$$x + w + z \leq 11$$

$$w + z - y \leq 29$$

45. d From the above table, out of the students that originally had a guava, the number of students now having a Mango is '32 - w'. Maximum possible value of w is 11.

Therefore minimum possible value of 32 - w = 32 - 11 = 21.

46. a Out of the students that originally had apple, the number of students now having a guava is 29 + y - w - z.

Maximum possible value of 29 + y - w - z is 37 when y = 8, w = z = 0.

Out of the students that now have an orange, the number of students that originally had a guava is 5 + w + x. Maximum possible value of 5 + w + x is 16, i.e. at x = 11(maximum possible value of x = 15).

47. a By the question, z = 7.

Required to find:

Maximum value of 5 + w + x

From the afore-mentioned inequalities  $w + x + z \leq 11$

$$\Rightarrow w + x \leq 4$$

$$\therefore \text{Required value} = 5 + 4 = 9.$$

48. b The question asks for maximum value of w + z

From the afore-mentioned inequalities  $w + x + z \leq 11$

If x = 0, then  $w + z \leq 11$ .

Thus, maximum value of w + z = 11.

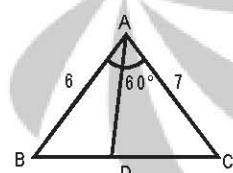
49. d By the question,

$$12 + w + z = 22 \text{ and } 29 + y - w - z = 14$$

$$\Rightarrow w + z = 10 \text{ and } w + z - y = 15 \Rightarrow y = -5, \text{ which is not possible.}$$

Thus, the data is inconsistent.

50. c



Let the length of AD = x cm

Area of  $\triangle ABD$  + Area of  $\triangle ADC$  = Area of  $\triangle ABC$

$$\Rightarrow \left( \frac{1}{2} \times 6 \times x \times \sin 30^\circ \right) + \left( \frac{1}{2} \times 7 \times x \times \sin 30^\circ \right) = \left( \frac{1}{2} \times 6 \times 7 \times \sin 60^\circ \right) \Rightarrow x = \frac{42\sqrt{3}}{13} \text{ cm}$$

$$\therefore AD = \frac{42\sqrt{3}}{13} \text{ cm.}$$

## Section II: VA & LR

51. Given below is a sentence, part of which is underlined. Beneath the sentence you will find four ways of phrasing the underlined part. Select the correct answer in terms of grammar and usage.

Analysts blamed May's sluggish retail sales on unexciting merchandise as well as the weather, colder and wetter than was usual in some regions, which has slowed sales of barbecue grills and lawn furniture.

- (a) colder and wetter than was usual in some regions, which has slowed  
**(b) which was colder and wetter than usual in some regions, slowing**  
(c) since it was colder and wetter than usually in some regions, which slowed  
(d) being colder and wetter than usually in some regions, slowing

51. b Options (c) and (d) can be eliminated because the correct phrase is 'colder and wetter than usual' and not 'usually'. Out of options (a) and (b), option (b) has the correct syntax. Option (a) mixes past tense with present perfect. Thus, option (b) is the correct answer.

52. For the word given at the top of the table, match the dictionary definitions on the left (1, 2, 3, 4) with their corresponding usage on the right (A, B, C, D). Out of the four possibilities given in the boxes below the table, select the one that has all the definitions and their usages correctly matched.

### Wash

1. to carry, bring, remove, or deposit (something) by means of water or any liquid, or as the water or liquid does	A. Much of the topsoil will wash away in spring.
2. the rough or broken water left behind a moving ship, boat, etc.	B. It is also noteworthy that underground workings suggest a close structural relationship between the granite porphyry dike and the Potosi Thrust which lies in the alluvial wash to the east of the mine
3. to be removed by the action of water	C. It is important not to have the water flowing too fast through the washing plant, as it will wash the gold through before it has time to settle.
4. to subject (earth or ore) to the action or force of water in order to separate valuable material.	D. The little boats tossed about in the wash from the liner's propellers.

- (a) 1–A, 2–C, 3–B, 4–D  
(c) 1–A, 2–C, 3–D, 4–B

- (b) 1–B, 2–D, 3–C, 4–A  
**(d) 1–B, 2–D, 3–A, 4–C**

52. d Option (d) is the correct answer.

53. 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/passage. From the given options, choose the most appropriate sequence.

- A. This new creature with long hair is a good deal in the way.  
B. I wish it would stay with the other animals.  
C. Cloudy today, wind in the east; think we shall see rain.  
D. 'We?' where did I get that word – the new creature uses it.  
E. It is always hanging around and following me about; I don't like this, I am not used to company.

- (a) ABCDE

- (b) BCDEA

- (c) CDBAE

- (d) AEBCD**

53. d Statements A, B and E should come together as they all talk about the creature not leaving the author alone. The paragraph begins with a description of the creature always coming in the way in statement A. It should be followed by E, which explains how the creature is always coming in the author's way and this is what makes the author wish that the creature spent time with its own kind in B. The author then changes the topic by talking about the weather and saying 'we shall see rain' in statement C. C should be followed by D as the author in D realizes what he has just said in C; he referred to himself with the plural pronoun 'we' just like the creature.

54. Given below are four sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are incorrect in terms of grammar and usage. Then, choose the most appropriate option.

- A. It is difficult to deny that the world of music has changed greatly since the past thirty years.
- B. The style, sound, technology, and lyrics of music has been altered greatly.
- C. In the last three decades, several new categories of music have come along.
- D. One reason music has changed so greatly is that artists use music as a tool to publicize certain social messages.

(a) A and D

(b) B and C

(c) C and D

**(d) A and B**

54. d In statement A, the preposition 'since' has been incorrectly used. The correct preposition should be 'over'. In statement B, there is subject- verb disagreement since the subject is plural (*style, sound, technology and lyrics*) and the verb 'has' that follows it is singular. The correct phrase should be – "style, sound, technology, and lyrics of music have been". Thus, option (d) is the correct answer.

55. 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.

On Hawaii's big island, marine biologist George Balazs seems to know most of the turtles by name—or at least by their markings and tags. He conducts what may be the longest continuous monitoring of any sea reptile, an effort of 34 years, and has presided over a cultural makeover that has turned the sea turtle, once a popular menu item, into the star of a multi-million dollar tourist industry. But Balazs credits the giant reptile itself. "The *honu* touch your heart," he says, using the Hawaiian word for turtle. \_\_\_\_\_

(a) "Not every endangered species is doomed."

(b) "These turtles are hundred dollar bills"

(c) "But a few people find the sight of these turtles better served on the plate than ambling on the sand".

**(d) "These turtles are their own best ambassadors."**

55. d Option (d) is most appropriate continuation of the paragraph because it aptly carries forward the idea of Balazs crediting the giant reptile itself for being the star of the tourist industry.

56. 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.

She soon realized that most pilots knew little if anything about the engines of their planes. That seemed to her to be like a doctor who knew nothing about the heart. Never afraid of hard work or dirty hands, she started hanging out with the mechanics at the flight school and worked herself into their favor as they realized she was serious about learning about airplane engines. \_\_\_\_\_.

- (a) By doing repairs, helping out with chores, and polishing airplanes, she also managed to eke her way through flight school.  
 (b) She demonstrated superb piloting skills, even doing stunt flying.  
**(c) The mechanics gradually started giving her challenging jobs.**  
 (d) One Friday, the master mechanic pointed to a worn-out engine and told her that she would have to take it apart and put back together again.
56. c The passage talks of how the female referred to in the passage started spending time with the mechanics in order to learn more about airplane engines. Among the options given, option (c) is the most appropriate sentence to follow the passage because doing 'challenging jobs' for the mechanics is a natural progression from 'hanging out' with them.

**Directions for questions 57 to 60:** Answer the questions on the basis of the information given below.

Ashok, Amit, Ajay, Akansh and Abhishek are five friends who live in five different cities namely Kunnamangalam, Joka, Vastrapur, Banerghatta and Prabandhnagar, not necessarily in that order. Their annual salaries (in INR) are 7,00,000, 8,00,000, 9,00,000, 11,00,000 and 13,00,000, in no particular order. Further, the following information is given:

- (i) Akansh, who does not live in Banerghatta, earns a salary that is a prime number multiple of 100000.
  - (ii) The person who lives in Prabandhnagar is not the one whose salary is the minimum amongst the five friends.
  - (iii) The absolute difference between the salaries of Akansh and Ajay is the same as the absolute difference between the salaries of Ashok and Abhishek.
  - (iv) The salary of the person who lives in Prabandhnagar is a perfect square multiple of 1,00,000.
  - (v) Ajay's salary (in INR) is 1,00,000 INR more than the average salary of Akansh and Ashok.
  - (vi) Amit lives in the city that has the shortest name amongst the given cities.
57. If Akansh lives in Vastrapur, then what is the average salary of the persons who live in Banerghatta and Kunnamangalam?  
 (a) Rs. 9 lakh      (b) Rs. 10 lakh      (c) Rs. 12 lakh      (d) **Data Insufficient**
58. Who lives in Prabandhnagar?  
 (a) Ashok      (b) Amit      (c) **Abhishek**      (d) Ajay
59. If Amit and Ajay live in cities with names starting with consecutive letters, who lives in Vastrapur?  
 (a) **Akansh**      (b) Amit      (c) Abhishek      (d) Ajay
60. If the salary of the person who lives in Banerghatta is neither maximum nor minimum, then what is the average salary of the persons who live in Kunnamanglam and Vastrapur?  
 (a) Rs.10.5 lakhs      (b) **Rs. 10 lakhs**      (c) Rs. 12 lakh      (d) Cannot be determined

**For questions 57 to 60:**

From statement (ii) the possibilities are

<b>Akansh</b>	7/9	11/13	7/11	9/13
<b>Ajay</b>	9/7	13/11	11/7	13/9
<b>Ashok</b>	11/13	7/9	9/13	7/11
<b>Abhishek</b>	13/11	9/7	13/9	11/7

From statement (v), Ajay's salary = 11,00,000.

⇒ Ashok's salary = 7,00,000 or 13,00,000.

⇒ Akansh's salary = 13,00,000 or 7,00,000.

Thus, the final scenario is as follows:

	Akansh	Ajay	Ashok	Abhishek	Amit
Salaries (In Rs. Lakh)	7 or 13	11	13 or 7	9	8
Cities:	K/V	B/K/V	B/K/V	Prabandhnagar	Joka

57. d If Akansh, lives in Vastrapur, then Ajay and Ashok must be staying at Kunnamangalam and Banerghatta, not necessarily in that order. Their average salary in any case will be Rs. 12 lakhs or 9 lakhs. So the data is insufficient.
58. c Abhishek lives in Prabandhnagar.
59. a Amit lives in Joka, so Ajay must be living at Kunnamangalam. Since Akansh is not staying at Banerghatta, he must be staying at Vastrapur.
60. b As person from Banerghatta did not earn maximum or minimum salary so he earns Rs.11 lakhs (from table). So average salary of persons living in Kunnamanglam and Vastrapur is  $\left(\frac{13+7}{2}\right)$  = Rs.10 lakhs.
61. 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.

One hundred years ago, on April 24, 1906, amid pomp and fanfare, the likes of which Annapolis had never seen, an American president lay to rest a national hero who had died more than a century before. The great man's remains had only recently been returned to these shores, rescued from an unmarked grave in a foreign land — a discovery that was hailed, on two continents, as a triumph. Yet, even at the time, there were voices that said that that the cadaver brought home in glory might be the wrong one. \_\_\_\_\_.

- (a) Two midshipmen with gleaming swords stand vigil over the body and a mystery nearly as old as our country itself.
- (b) The stillness of the crypt is broken by the voice of a tour guide in Colonial costume.
- (c) They have never been completely silenced.**
- (d) And then, doubt led to the deadly discovery.
61. c The last sentence of the passage talks of the 'voices' that speculated that the dead body might not have been the body of the national hero. Option (c) follows from this, because 'they' who 'have never been completely silenced' refers to the 'voices' that said so.

**Directions for questions 62 to 65:** Fill up the blanks, numbered [8] to [11], in the passage given below with the most appropriate word from the options given for each blank.

And although his injury had [62], probably forever, his powers of movement, and for the time being it took him long, long minutes to creep across his room like an old [63] - there was no question now of crawling up the wall - yet in his own opinion he was sufficiently [64] for this worsening of his condition by the fact that towards evening the living-room door, which he used to watch intently for an hour or two beforehand, was always thrown open, so that lying in the darkness of his room, invisible to the family, he could see them all at the lamp-lit table and listen to their talk, by general consent as it were, very different from his earlier [65].

62. (a) healed                                 **(b) impaired**                                 (c) hemmed                                 (d) worsened
62. b The verb here should be such that should appropriately modify 'powers of movement'. 'Healed' is opposite to the meaning implied in the given sentence. Among the given options, 'impaired' fits best. Thus, option (b) is the right answer.
63. (a) debaucher                                 (b) mendicant                                 (c) sickly   **(d) invalid**
63. d 'Invalid' is the right answer because the sentence compares the slow creeping of this man to that of an old man. 'Debaucher' and 'mendicant' do not fit in the blank at all, because the required word should refer to a physically diseased person. Hence, option (d) is the right answer.
64. (a) enervated                                     (b) ameliorated                                     **(c) compensated**                                     (d) disposed
64. c The passage implies that the loss of the powers of movement has been somewhat mitigated by the fact that the person is able to overhear the conversation of the 'family' with great ease. Thus, the word that fits best is 'compensated'. Hence, option (c) is the right answer.
65. (a) peering   **(b) eavesdropping**                             (c) assimilations                                 (d) snuffles
65. b It is implied here that the listener is able to hear the 'talk' with much greater ease now and with the 'consent' of the family, something denied to him earlier. Thus, the word 'eavesdropping' is appropriate here, for it refers to overhearing someone's conversation without consent. Hence, option (b) is the right answer.

**Directions for questions 66 to 69:** The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

Is ethics, or can it ever be, in some sense of the word, a 'science'? This question has been debated at length by ethical theorists, and tends to divide them into two broad camps. According to the 'continuity' position, science and ethics share basic similarities, and even if ethics may not really be a science, there are many more points of congruence between the two than popularly acknowledged. The 'discontinuity' camp, on the other hand, assert that ethics and science are fundamentally different kinds of activity, and the two shall never meet.

To clear up a possible confusion, I am not talking here about the ethics of doing science. That is, of course, a perfectly legitimate branch of philosophy and ethical theory, and the controversies regarding it are of an applied nature, concerning specific instances of ethical or unethical behavior on the part of the scientific community. What the continuity-discontinuity debate is concerned with instead, is the very nature of ethical inquiry: can it be in any sense scientific?

The debate may seem bizarre and quite anachronistic: didn't Hume in *A Treatise of Human Nature* (1739-40) clearly state that one cannot derive what *ought* to be (i.e. a moral answer) from what *is* (i.e. an empirical answer)? Well, first off, Hume didn't really say that you cannot do it, just that if you indeed do it, you had better be prepared to justify that move, not taking it as automatic, as apparently some of his colleagues at the time used to do. But the dispute that we are concerned with here is a bit more subtle: it is about whether ethicists may proceed about their business (i.e. finding ethical truths) in roughly the same way scientists do theirs – by discovery.

Let us begin with some exponents of the continuity between ethics and science. One way to think of it is proposed by A. Edel, who sees different fields as characterized by different degrees of 'scientificality', with the hard sciences of physics and chemistry at one extreme, the social sciences in the middle, and ethics

at the other end. Edel observes that science is not value-free, and hence involves some degree of judgement of a kind similar to moral decision making. Furthermore, the theory-ladenness of scientific investigations (i.e. the idea that 'facts' don't really have scientific meaning unless embedded within a particular theory, which in turn determines what counts as 'fact'), also contributes to making science much more like a humanistic discipline than scientists would like to admit. One crucial problem faced by continuity theorists, however, comes from what sense, if any, one can give to the idea of testing ethical theories in a way analogous to scientific ones. For example, Virginia Held proposes that one can do just that using 'moral experience', analogous to empirical findings in science; but moral experience turns out to be a rather vague concept when compared to even a moderately post-modernist account of empirical investigation in science.

For discontinuity proponents like John Rawls on the other hand, moral 'facts' are of a very different nature than scientific facts, even though both are theory-laden. In moral theory, according to Rawls, it is indeed possible to reach a consensus about what constitutes a fact, but only because this fact is *constructed* by certain sections of humanity that share a similar background and view of the world. Another prominent discontinuity theorist is Alan Gibbard, who says that facts in the natural sciences have an explanatory role that cannot possibly find an equivalent in moral theory. In the moral case, to say that something is wrong is to express an attitude, not an empirical finding.

As in most situations, however, there may be a happy middle ground between continuity and discontinuity in the science-ethics debate. Indeed, even discontinuity supporters such as Gibbard make heavy use of scientific information, for example from evolutionary biology or game theory. The idea here seems to strike a good compromise: it is not that ethics is (or works like) a science; rather, modern ethical theory simply can't afford to ignore what the natural sciences tell us about human nature, about the neurological basis of moral decision-making, and about the evolution of morality itself. This seems the new route followed by authors like Peter Singer. It is a position that calls for cooperation between science and ethics. After all, human beings display a mixture of selfish and cooperative behaviours, at least in part as a result of their evolutionary ancestry. It doesn't seem productive for ethics to ignore such biological baggage and make pronouncements in an empirical vacuum; but only science can help fill that void.

66. What does the author think about the ethicality of pursuing science?
  - (a) He believes that this issue has not been addressed properly
  - (b) He is of the opinion that the ethicality of pursuing science is a different debate**
  - (c) He considers that to be an issue that is best left to the policy-makers to decide
  - (d) He does not believe that he has adequate information on the subject
66. b The author mentions this at the beginning of the second paragraph. "That is, of course, a perfectly legitimate branch of philosophy and ethical theory, and the controversies regarding it are of an applied nature, concerning specific instances of ethical or unethical behavior...", making option (b) the correct answer.
67. Which of the following, according to Alan Gibbard, is one of the problems with the idea of drawing a parallel between ethics and science?
  - (a) He thinks that, in the case of ethical debates, facts are explanatory
  - (b) He feels that facts in ethical debates are subjective**
  - (c) He considers scientific rigor to be a part of a scientist's psyche, which is not the case with an ethicist
  - (d) He believes that ethics are scientific but those who conduct ethical experiments are not

67. b The author quotes Alan Gibbard in the fifth paragraph. "...that facts in the natural sciences have an explanatory role that cannot possibly find an equivalent in moral theory. In the moral case, to say that something is wrong is to express an attitude, not an empirical finding", making option (b) the correct answer.
68. What is the author's answer to the question raised in the passage – is ethics a science?  
 (a) Yes, since science also has to use ethics  
 (b) Human beings are innately scientific by nature  
 (c) No, because ethics does not have "facts"  
**(d) Ethics can use scientific knowledge in its debates**
68. d The author answers the question in the last paragraph of the passage. "The idea here seems to strike a good compromise: it is not that ethics is (or works like) a science; rather, modern ethical theory simply can't afford to ignore what the natural sciences tell us about human nature...", making option (d) correct.
69. Why does A. Edel consider science and ethics to be similar?  
 (a) He thinks that scientists cannot escape the fallibility of being human  
**(b) He believes that scientists frequently use subjective judgements**  
 (c) He considers science to be a field replete with vagueness  
 (d) He notices many gaps in scientific discoveries which can be filled with ethics
69. b The author mentions A. Edel's beliefs in the fourth paragraph. He mentions "Edel observes that science is not value-free, and hence involves some degree of judgement of a kind similar to moral decision making", which makes option (b) correct.

**Directions for questions 70 to 73:** The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

Is Alain Badiou the next great French import into American academe? A hundred or so people squeezed into a small open space on the second floor of Labyrinth Books, near Columbia University, this month to find out at a public discussion between Mr. Badiou, a professor of philosophy at the École Normale Supérieure, in Paris, with intellectual roots in Marxism and in the upheavals of 1968 in France, and Simon Critchley, a professor of philosophy at the New School for Social Research and the University of Essex, in England.

Mr. Badiou's sharply worded attacks on conventional wisdom in his later books — including his close questioning of such concepts as evil and democracy — have gained considerable attention elsewhere in the world.

In *Metapolitics*, for instance, there is a piece called "A Speculative Disquisition on the Concept of Democracy." In it, Mr. Badiou argues that, "in fact, the word 'democracy' concerns what I shall call authoritarian opinion. It is forbidden, as it were, not to be a democrat. ... If 'democracy' names a supposedly normal state of collective organization or political will, then the philosopher demands that we examine the norm of this normality. He will not allow the word to function within the framework of authoritarian opinion."

Mr. Badiou's aims in *Being and Event* divide neatly according to the title. First he dissects "being" with the aid of set theory, the mathematical study of abstract groups of objects (sets) and their relations to one another. Then he explains how change occurs in the world, a process that he calls an "event." As the philosopher himself told the audience, he finds the second issue more interesting. "The great question for me is not really what 'being' is," he said. "My fundamental question is a very simple one — and small. What, exactly, is something new? What is creation?"

Much of the alleged inaccessibility of Mr. Badiou's work is rooted in his reliance on set theory to discuss ontology, the branch of philosophy that deals with existence. Indeed, *Being and Event* makes the striking

claim that “mathematics is ontology.” The book is studded with equations and theorems that may frighten off the scholar who fled to the humanities to escape mathematics.

“It’s a phobia,” said Mr. Badiou with a grin when Mr. Critchley brought up the topic of some scholars’ resistance to the mathematical concepts that Mr. Badiou employs. “My goal is to change a phobia into love,” he said. And while the clusters of equations in *Being and Event* look complicated, his reliance on them is explained with little difficulty.

As Mr. Badiou sees it, a central part of the story of philosophy in the past century is the displacement of the notion of “being” as a unitary entity with the idea that it is made up of multiplicities. Thus, he reasons, if existence is really “pure multiplicity,” and those “elements of multiplicity are multiple themselves,” then set theory is an ideal way to approach ontological questions.

*Being and Event* uses set theory to interrogate philosophers from Plato to Pascal to Heidegger. At his talk, Mr. Badiou observed that it is not merely those in the humanities who are uncomfortable with that tactic. “Mathematicians don’t know that mathematics is ontology,” he quipped with evident delight.

As the discussion with Mr. Critchley moved from “being” to “event,” the French philosopher struck a biographical note. He observed that his thoughts on those questions were stimulated by his experiences during and after the political and cultural upheavals in Paris in 1968. Mr. Badiou, who was swept up in the fierce leftist political debates of the time, remains largely committed to the ideals embodied in the tumult of that year.

“I have had a living experiment of something new,” he said, “and when something happens that is novelty, you have the birth of a new subject.”

Grappling with how Mr. Badiou defines “event” is more complicated, perhaps, than all of the set theory. In essence, an “event” is a clear break with the status quo. That break creates what Mr. Badiou defines as a “truth.” The break that creates the truth also creates a “subject,” which takes its definition from what the philosopher calls the subject’s “fidelity” to that singular truth.

It is slippery stuff indeed, but Mr. Badiou offered his audience the metaphor of falling in love as a way to grasp it. Two people meet and fall in love, which is a break from their previous status quo. It creates a “truth” (they are in love), and that condition of being in love (the “subject”) is defined by their fidelity to that love.

He sees those creations of truth as manifesting themselves in four main arenas: art, love, science, and politics. Much of his work since writing *Being and Event* has been devoted to exploring how the implications of his philosophy ripple through those areas.

Mr. Badiou also took considerable interest in a question about why religion was excluded from the areas that he identifies as sites for the work of philosophy. He said that the question of why he had limited such areas to four came up often, and “my answer is that I don’t find another.”

70. Why does Badiou think that democracy has become like an authoritarian opinion?
  - (a) He thinks that even democratically elected politicians behave in an authoritarian fashion.
  - (b) He is convinced that people are authoritarians at heart.
  - (c) He is convinced that people are coerced into becoming a democrat.**
  - (d) He strongly believes that democracies cannot survive without authoritarianism.

70. c Refer to the third paragraph. Option (c) clearly follows from this.

71. As per the passage, which of the following is correct with reference to the relation between mathematics and ontology?
- (a) Badiou believes that mathematics is dependent on ontology.
  - (b) Mathematicians and philosophers do not think that the two are related.
  - (c) The two are independent of each other, according to Badiou.
  - (d) None of the above**
71. d The author mentions these relationships in paragraphs six to eight. Options (a), (b) and (c) do not follow from these. Hence, option (d) – none of the above – is correct.
72. Which of the following is true about Badiou's idea of an event?
- (a) The fidelity of love is the most supreme manifestation of an event.
  - (b) The subject created after an event exists independent of the subject's loyalty to the truth.
  - (c) The subject created after an event has to be loyal to the truth in order to be a true subject.**
  - (d) The subject of an event is created before the event but the loyalty factor becomes crucial after the event has taken place.
72. c The author mentions this in the eleventh and twelfth paragraphs. According to Badiou's definition, the subject created after the event is defined by "...what the philosopher calls the subject's "fidelity" to that singular truth", making option (c) the correct answer.
73. According to Badiou, why did he explore the implications of his work in four areas only?
- (a) Because no other area is a site for the work of philosophy.**
  - (b) Because he has expertise in these areas only.
  - (c) Because these areas are interrelated in complicated ways.
  - (d) Because his life has proven that these four are the highest areas of philosophical inquiry.
73. a The author answers this question in the last paragraph; "...my answer is that I don't find another", which makes option (a) the correct answer.

**Directions for questions 74 to 77:** Answer the questions on the basis of the information given below.

Nine friends – A, B, C, D, E, F, H, I and J – joined a fitness center. The fitness center is closed on Monday. At the fitness center, a week starts from Tuesday and ends on Sunday. On each of the six days of a particular week, exactly three persons, out of the nine, visited the fitness center such that each person visited the fitness center on at least one day of that week. There are exactly four persons who visited the fitness center on more than two days. It is also known that:

- (I) Both D and E visited the fitness center on three of the first four days of the week.
  - (II) H visits the fitness center only on those days when both A and B visit the fitness center.
  - (III) Each of B, I and J visited the centre only once and on different days of the week.
  - (IV) C and F always visit the fitness center on the same day of the week.
  - (V) None of the persons visited the fitness center on three consecutive days of the week.
74. Which of the following persons visited the fitness center on exactly three days?
- (a) H
  - (b) A
  - (c) C**
  - (d) Cannot be determined
75. If A did not visit the fitness center on Sunday and J visited the fitness center only on Friday, which of the following can be the day on which I visited the fitness center?
- (a) Wednesday
  - (b) Thursday
  - (c) Saturday
  - (d) Sunday**

76. If E and I visited the fitness center on Sunday and Friday respectively, on which day did J visit the fitness center?  
 (a) Tuesday      (b) Wednesday      (c) Thursday      (d) Saturday
77. Which of the following can visit the fitness center on four days?  
 (a) A      (b) C      (c) F      (d) E

**For questions 74 to 77:**

From statement (I) and (II), A, B, D, E and H could have attended the fitness center in one of the following ways:

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Tue	DE_	DE_	DE_	DE_	DE_	DE_	DE_	DE_
Wed	DE_		D_	E_	DE_		D_	E_
Thu		DE_	E_	D_		DE_	E_	D_
Fri	DE_	DE_	DE_	DE_	DE_	DE_	DE_	DE_
Sat	ABH	ABH	ABH	ABH				
Sun					ABH	ABH	ABH	ABH

Case (i), (ii), (v) and (vi) would violate the condition that exactly four persons visit the fitness center on more than two days. Hence, the final possible scenarios are as follows:

	(i)	(ii)	(iii)	(iv)
Tue	DE_	DE_	DE_	DE_
Wed	DCF	ECF	DCF	ECF
Thu	ECF	DCF	ECF	DCF
Fri	DE_	DE_	DE_	DE_
Sat	ABH	ABH	CF_	CF_
Sun	CF_	CF_	ABH	ABH

Since, B, I and J visit the center only once and on different days of the week, one of the remaining spots in each of the four cases will be filled by one of A, D and E.

74. c C, F, D and E are the only people who could have visited the center on exactly three days. Out of these, C and F definitely visited the center on exactly three days.
75. d In the second table above cases (ii) and (iv) are no longer possible. It can also be seen that A would visit the center on Monday. Thus, I visits the center on Sunday.
76. a If E and I visit the fitness center on Sunday and Friday respectively then, J visits the center on Tuesday.
77. d D and E are the only ones who can visit the center on four days.

**Directions for questions 78 to 81:** The passage given below is followed by a set of four questions. Choose the most appropriate answer to each question.

Every day, experts bombard us with their views on topics as varied as Iraqi insurgents, Bolivian coca growers, European central bankers, and North Korea's Politburo. But how much credibility should we attach to the opinions of experts?

The sanguine view is that as long as those selling expertise compete vigorously for the attention of discriminating buyers (the mass media), market mechanisms will assure quality control. Pundits who make it into newspaper opinion pages or onto television and radio must have good track records; otherwise, they would have been weeded out.

Skeptics, however, warn that the mass media dictate the voices we hear and are less interested in reasoned debate than in catering to popular prejudices. As a result, fame could be negatively, not positively, correlated with long-run accuracy.

Until recently, no one knew who is right, because no one was keeping score. But the results of a 20-year research project now suggest that the skeptics are closer to the truth.

I describe the project in detail in my book *Expert Political Judgment: How good is it? How can we know?* The basic idea was to solicit thousands of predictions from hundreds of experts about the fates of dozens of countries, and then score the predictions for accuracy. We find that the media not only fail to weed out bad ideas, but that they often favor bad ideas, especially when the truth is too messy to be packaged neatly.

The evidence falls into two categories. First, as the skeptics warned, when hordes of pundits are jostling for the limelight, many are tempted to claim that they know more than they do. Boom and doom pundits are the most reliable over-claimers.

Between 1985 and 2005, boomsters made 10-year forecasts that exaggerated the chances of big positive changes in both financial markets (e.g., a Dow Jones Industrial Average of 36,000) and world politics (e.g., tranquility in the Middle East and dynamic growth in sub-Saharan Africa). They assigned probabilities of 65% to rosy scenarios that materialized only 15% of the time.

In the same period, doomsters performed even more poorly, exaggerating the chances of negative changes in all the same places where boomsters accentuated the positive, plus several more (I still await the impending disintegration of Canada, Nigeria, India, Indonesia, South Africa, Belgium, and Sudan). They assigned probabilities of 70% to bleak scenarios that materialized only 12% of the time.

Second, again as the skeptics warned, over-claimers rarely pay penalties for being wrong. Indeed, the media shower lavish attention on over-claimers while neglecting their humbler colleagues.

We can see this process in sharp relief when, following the philosopher Sir Isaiah Berlin, we classify experts as "hedgehogs" or "foxes." Hedgehogs are big-idea thinkers in love with grand theories: libertarianism, Marxism, environmentalism, etc. Their self-confidence can be infectious. They know how to stoke momentum in an argument by multiplying reasons why they are right and others are wrong.

That wins them media acclaim. But they don't know when to slam the mental brakes by making concessions to other points of view. They take their theories too seriously. The result: hedgehogs make more mistakes, but they pile up more hits on Google.

Eclectic foxes are better at curbing their ideological enthusiasms. They are comfortable with protracted uncertainty about who is right even in bitter debates, conceding gaps in their knowledge and granting legitimacy to opposing views. They sprinkle their conversations with linguistic qualifiers that limit the reach of their arguments: 'but,' 'however,' 'although.'

Because they avoid over-simplification, foxes make fewer mistakes. Foxes will often agree with hedgehogs up to a point, before complicating things: "Yes, my colleague is right that the Saudi monarchy is vulnerable, but remember that coups are rare and that the government commands many means of squelching opposition."

Imagine your job as a media executive depends on expanding your viewing audience. Whom would you pick: an expert who balances conflicting arguments and concludes that the likeliest outcome is more of

the same, or an expert who gets viewers on the edge of their seats over radical Islamists seizing control and causing oil prices to soar?

In short, the qualities that make foxes more accurate also make them less popular.

At this point, uncharitable skeptics chortle that we get the media we deserve. But that is unfair. No society has yet created a widely trusted method for keeping score on the punditocracy. Even citizens who prize accuracy have little way of knowing that they are sacrificing it when they switch channels from boring foxes to charismatic hedgehogs.

Here, then, is a modest proposal that applies to all democracies: the marketplace of ideas works better if it is easier for citizens to see the trade-offs between accuracy and entertainment, or between accuracy and party loyalty. Wouldn't they be more likely to read pundits with better track records? If so, pundits might adapt to accountability by showing more humility, and political debate might begin to sound less shrill.

Granted, it is not easy to create methods of keeping score that are credible across the spectrum of reasonable opinion. But in a world where, as Yeats said, "and the best lack all conviction, while the worst are full of passionate intensity," it is worth trying.

78. What does the author mean by talking about the possible negative correlation between fame and long-run accuracy?
- (a) Famous people start believing in their superiority, leading to oversights.
  - (b) Long-run accuracy is only possible after rigorous groundwork while famous people do not have the time to do such groundwork.
  - (c) Famous people are liked because they pander to the misconceptions of the public.**
  - (d) Accuracy is difficult to achieve in politics and famous people have higher incentives to avoid accuracy.
78. c The author makes this statement in the third paragraph, "...are less interested in reasoned debate than in catering to popular prejudices." This makes option (c) the correct answer.
79. What point does the author make using the examples of those who predict probabilities of 65% in the case of rosy scenarios and those who predict negative occurrences in Canada?
- (a) The mass media is partial to those who make exaggerated predictions.
  - (b) People like forecasts where the outcome is predicted to be significantly different from what they earlier believed in.
  - (c) Those who make extreme predictions are most likely to be wrong.**
  - (d) Political pundits are usually supportive of those who make extreme predictions.
79. c The author mentions these two types in the seventh and eighth paragraphs. In the sixth paragraph, he says "Boom and doom pundits are the most reliable over-claimers" which he then demonstrates with examples. This makes option (c) the correct answer.
80. What does the author mean when he says hedgehogs pile up more hits on Google?
- (a) Those who make extreme predictions manage to pique people's interest more.**
  - (b) Animals are the most popularly searched things on the internet.
  - (c) Google founders can be called hedgehogs.
  - (d) Google's success is based on the popularity of extreme predictions.
80. a Refer to the tenth and eleventh paragraphs. Option (a) follows from this.

81. According to the passage, why do the media favour the hedgehogs?
- Because they present big ideas which are more inspiring.**
  - Because they predict radical changes while making concessions to other points of view.
  - Since they are extroverts and are better orators.
  - Because of their ability to impress the media executives.
81. a The author mentions this in the fourteenth paragraph, "Whom would you pick: an expert who balances conflicting arguments and concludes that the likeliest outcome is more of the same, or an expert who gets viewers on the edge of their seats over radical Islamists seizing control and causing oil prices to soar?" According to the author, the decision is dependent upon the ability of the hedgehogs to talk about extreme scenarios and grab the audience's attention. This makes option (a) the correct answer.

**Directions for questions 82 to 84:** Answer the questions on the basis of the information given below.

There are four married couples. A, B, C and D are the male members, and E, F, G and H are female members making the four couples. Each couple celebrates its marriage anniversary on a different date from among 7th, 12th, 14th and 24th, falling in different months out of March, May, October and December. Further, the following information is given:

- (i) E celebrates her marriage anniversary on a date the numerical value of which is twice the numerical value of the date on which H celebrates her marriage anniversary.
  - (ii) The sum of the numerical values of the date and the month number of the marriage anniversary of D, is equal to the numerical value of the date of the marriage anniversary of C.
  - (iii) A and E are married to each other. Only for this couple, the sum of the numerical values of date and the month number of their marriage anniversary is a prime number.
  - (iv) A and D celebrate their marriage anniversaries in different months starting with the same letter.
82. If G's marriage anniversary falls on 24<sup>th</sup> December, which of the following combinations of a couple and the date on which they celebrate their marriage anniversary could be correct?
- |                        |                              |
|------------------------|------------------------------|
| (a) D-F, 7th May       | (b) <b>C-F, 12th October</b> |
| (c) C-G, 24th December | (d) D-H, 7th March           |
83. If the sum of the numerical values of the date and the month number of marriage anniversary of F is maximum but not a perfect square, who is the husband of F?
- |              |       |       |                   |
|--------------|-------|-------|-------------------|
| (a) <b>B</b> | (b) C | (c) D | (d) Either B or C |
|--------------|-------|-------|-------------------|
84. If the sum of the numerical values of the date and the month number of marriage anniversary of F is maximum but not a perfect square, what is the date on which G celebrates her marriage anniversary?
- |                    |                  |                   |                          |
|--------------------|------------------|-------------------|--------------------------|
| (a) <b>7th May</b> | (b) 12th October | (c) 12th December | (d) Cannot be determined |
|--------------------|------------------|-------------------|--------------------------|

**For questions 82 to 84:**

From statement (i), E's anniversary date can be 14th or 24th and that of H can be 7th or 12th in that order.

From statement (ii), the anniversary date of D can be 7th May or 12th December and correspondingly C's anniversary date can be 12th or 24th.

From statement (iii), the anniversary date of A-E can be 24th May or 14th May or 14th March.

From above conclusions and statement (iv), we can conclude that A's marriage anniversary is on 14th March and D's marriage anniversary is on 7th May.

Thus, C's anniversary date comes out to be 12th. For both D and H, the marriage anniversary date comes out to be 7th May. So, they must form a couple.

<b>Husband</b>	A	B	C	D
<b>Wife</b>	E	F/G	G/F	H
<b>Anniversary date</b>	14	24	12	7
<b>Month</b>	March	Oct/Dec	Dec/Oct	May

82. b Only option (b) is a possible combination.

**For questions 83 and 84:**

The possible anniversary dates of F can be 24th October or 24th December or 12th October or 12th December. Among these only 24th October and 24th December gives the maximum value, in other cases sum is not maximum.

But 24th December =  $24 + 12 = 36$  is a perfect square.

So F's anniversary is on 24th October.

As B has his anniversary date on 24th so F is the wife of B.

83. a B is the husband of F.

84. c G's marriage anniversary is on 12th December.

**Directions for questions 85 to 88:** The passage given below is followed by a set of four questions. Choose the best answer to each question.

The majority of enterprise technology's value consists of nonquantifiable gains such as improved communication and information sharing. Unfortunately, if the user of this technology is unwilling to share or collaborate, little is gained from deploying a sales-force automation, collaborative, or other enterprise application. Four basic human-barrier categories hinder overall technology acceptance: individual, hierarchical, structural, and cultural. And these areas require a change in the way a company conducts business to overcome their potential devastation.

**Individual:** Individual Collaboration benefits rely on the willingness of users to both share information and reuse information created by others. Although traditional corporate cultures reward individuals for their knowledge, they often measure success compared to other employees—enforcing the belief that knowledge is power and that employees need to guard it. Freely sharing this knowledge makes employees vulnerable, and in a competitive organization, it can be detrimental to their careers.

Before undertaking an initiative, organizations should examine their corporate culture. It is likely that individuals will feel threatened by any project that pushes them to share information, making it critical to "sell" the application based on the benefits to the users, not the benefits to the company. If there is any single worst example of poorly selling an application to users, it is the frequent deployment of a sales-force automation application based on the need to capture knowledge about customers and prospects. Salespeople, who are compensated on their individual ability to close deals, may feel their job security threatened, when asked to share all of their information. It can result in noncompliance or, at worst, a knowledge base filled with bad information.

A better strategy is to deploy a Customer Relationship Management (CRM) system that couples the capture of organizational knowledge with tools for increasing individual productivity, and focus on promoting the productivity functionality to users.

**Structural:** Groups within companies do not always share information freely—and collaboration tools alone will not change them. If greater sales feedback on product development is needed, marketing may need to overcome its natural instinct to withhold information on new products for fear of impacting current sales.

The ideal strategy for overcoming structural barriers is to avoid them from the outset. Focus on collaborative efforts within groups and show the benefits collaboration can provide. If the accounting department recognizes the benefits of collaboration during the annual audit, it will be more receptive when marketing asks them to be part of a team.

Hierarchical: In the traditional business world, doors create power and stature over the "nondoor world," but the electronic world has no doors. To compound the problem, e-mail addresses do not carry titles. Participating in a global e-mail removed can be either the CFO or the summer intern. He only gains stature within a group based on the knowledge he brings. And Bill may never meet the CEO, but he can send him his thoughts on his supervisors directly via e-mail—or even better, start a discussion group on what he believes is wrong with the company. Good managers will appreciate the openness and availability of a new channel for feedback. Bad managers may subtly try to undermine the effort. To benefit from collaboration, managers must learn to coach rather than control.

Tone and context are also important to consider in an electronic environment. When tone is absent, it's often difficult to look past an electronic message to understand the true communication. Does a short response to an employee mean the boss is angry, or just busy? Similar attention to electronic tone in the corporate communication setting can improve negotiations, reduce misunderstanding, and raise morale in an organization where e-mail communication is displacing face-to-face or telephone contact. If the most important step in deploying a collaborative application is the sales pitch to the user, the second most important is training management to command and coach with appropriate tone in the electronic world.

Cultural: We all recognize that people of different cultures communicate and collaborate in different ways. Japanese, Germans, French and Americans all have different cultural styles to group dynamics. Asking a cross-cultural group to collaborate electronically is likely to result in less than the expected results. To ensure success, care must be taken in first assembling cross-cultural groups that are focused on a single objective or have similar backgrounds. Where cross-cultural groups are needed, it is important to foster relationships outside the electronic medium. One successful company eliminated potential confusion in using written communication by mandating that the phone was the first medium for one-on-one collaboration, while e-mail was the second. When deploying technology that impacts the way users work, focusing on identifying potential barriers and using techniques to limit their negative impact on the deployment will drive a smoother deployment and a faster path to a positive return on investment.

85. Which of the following titles would adequately encompass the scope of the passage?
- (a) **Barriers to Corporate Technology Adoption**
  - (b) The Importance of an advanced CRM system
  - (c) Maximizing Profit through Cross-cultural Collaboration
  - (d) The Misuse of Enterprise Technology in Corporate environments
85. a The passage essentially talks about four barriers to the effective adoption of technology in corporate environments and tries to offer suggestions on how to deal with those barriers. Thus, option (a) is the correct answer.
86. According to the passage, it is traditionally believed that
- (a) The past would be a logical foundation to predict future customer needs and profitability.
  - (b) **Freely sharing their knowledge makes employees vulnerable, and can be detrimental to their careers.**
  - (c) Collaboration across a hierarchical structure results in ambiguity in delegation of responsibility.
  - (d) Better customer relationships would deter attrition.

86. b The passage states, ‘...traditional corporate cultures reward individuals for their knowledge, they often measure success compared to other employees —enforcing the belief that knowledge is power and that employees need to guard it. Freely sharing this knowledge makes employees vulnerable, and in a competitive organization, it can be detrimental to their careers.’ Option (b) follows from this.
87. The passage mentions which of the following possible ways to reduce confusion arising out of cross-cultural collaboration?  
(a) relying more on e-mails for communication  
(b) introducing collaborative efforts among various teams within a company  
**(c) making telephonic conversation the primary mode of communication**  
(d) relying more on letter writing
87. c The passage states, ‘One successful company eliminated potential confusion in using written communication by mandating that the phone was the first medium for one-on-one collaboration, while e-mail was the second.’ Hence, option (c) is the correct answer.
88. Which of the following statements is a valid inference as per the passage?  
(a) The author thinks that sharing information with colleagues can be detrimental to one’s career.  
(b) Most Customer Relationship Management programmes deployed by companies today are outdated.  
**(c) Control of power, rather than collaboration, is what has traditionally driven hierarchical structures in companies.**  
(d) The content, rather than the tone of an e-mail, is the factor of prime importance in an official e-mail.
88. c The sixth paragraph of the passage talks about how, within hierarchical structures in companies, the control of power keeps people from fruitfully collaborating with each other.
89. The following text is followed by four alternative summaries. Choose the option that best captures the essence of the text.

Teachers of philosophy have far more control on the boundaries and contours of their discipline than they used to: they think of themselves as professional academics, which means that the only intellectual relationships that really matter to them are the ones they have with their so-called peers. If you wanted to devise a system for discouraging imagination and innovation, you could not do better than the current system of peer-reviewed “research”. Everyone knows that the system creates misery for those who do not come up to scratch when their work is evaluated. But it is no less damaging for those who are going to succeed, because they will always be forced to dance to other people’s tunes. When I was a student, I was appalled by the weakness of intellectual ambition amongst my teachers, but when I compare it with the thrusting careerism of the present I look back on them as admirable free spirits.

- (a) The peer system in philosophy creates a claustrophobic environment where approval of others is important. It is more damaging to those who get this approval as they become suddenly ambitious, only to realize later that it is futile.  
**(b) The peer-review system in philosophy creates a claustrophobic environment where approval of others is important. It is as damaging to those who do well as it is to those who do not because the former have to work within limits.**

- (c) The peer system in philosophy created a claustrophobic environment where approval of others is important. But the new generation's ambition seems to be taking care of this, albeit in a gradual manner.
- (d) The peer system in philosophy creates a claustrophobic environment where approval of others is important. The older generation was better off as they handled it better and with dignity.
89. b The author mentions the limitations of philosophy where "peer approval" is important. For someone who gets rejected, it's obviously harmful. But if someone wins approval, even then it is destructive because the person still has to "dance to other people's tunes". This makes option (b) correct.
90. 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/passage. From the given options, choose the most appropriate sequence.
- The "colored person" in question was Langston Hughes and within a few years of the poem's publication he would be known to all of Black America and to any lovers of prose poetry elsewhere whose appreciation allowed them to venture across the colour line at the time.
  - Inside it was a poem called "The Negro speaks of rivers".
  - In 1920, an envelope postmarked from Kentucky arrived at the offices of the African-American artistic and intellectual magazine Crisis.
  - "I took the beautiful dignified creation to Dr du Bois," she recalled, "and said 'What colored person is there, do you suppose, in the United States who writes like that and is yet unknown to us?'"
  - When the literary editor, Jessie Fauset, read it, she handed it straight to her editor and mentor, WEB du Bois.
- (a) CEBAD      **(b) CBEDA**      (c) DEACB      (d) DBACE
90. b C starts the sequence as it talks of the first event – the arrival of the letter. B mentions what's inside "it", making CB a mandatory pair. E mentions the chain of events that followed – Jessie handing the letter to the editor and referring to a coloured person who writes like this, making ED another mandatory pair. The "colored person" is then introduced in A, which is the last sentence. This makes option (b) correct.
91. Doctor: Ingesting calcium-rich diet cannot be a cause for hypercalcemia in itself; rather, it could be a consequence of a sudden increase in the intake of calcium through pills and other sources. When people, who don't require calcium from external medium, suddenly increase their intake of calcium through pills and the likes, they end up increasing their risk of hypercalcemia. The implication of this is that, due to the new health program, the risk of hypercalcemia among children of this school will increase.  
The conclusion drawn by the doctor follows logically if which of the following is assumed?
- (a) **Students will suddenly increase their calcium dosage through pills as a consequence of the new health program.**
- (b) The pills recommended as part of the new health program will lay more stress on ingesting calcium than those recommended in the previous health program.
- (c) The new health program will force all kinds of students to take calcium pills regularly.
- (d) All students, irrespective of their physical condition, will be made to take pills as per the new health program.
91. a Only if we assume that the new health programme will force children to suddenly increase their calcium dosage, can we conclude that the risk of children of this school suffering from hypercalcemia will increase due to the new health programme. Thus, option (a) is the right answer.

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

### Black

- (a) The manager blacked out the whole building during the emergency to prevent an explosion.  
**(b) He was beaten black and white at the boarding school.**  
(c) The devil is definitely not as black as he is painted.  
(d) My father was the black sheep of the family – he ran away at sixteen to become an actor and his parents never forgave him.

92. b The correct idiom is ‘to beat somebody black and blue’, which means to hit somebody until they are covered with bruises. Thus, option (b) is the right answer.

93. Researcher A: Ebola spreads through air and so one should not be anywhere within the radius of 2 kilometers of a person suffering from Ebola.

Researcher B: No, Ebola is not airborne; it is mainly transmitted through direct contact with the body and bodily fluids of a person suffering from Ebola.

Which of the following, if true, would strengthen researcher B’s argument?

- (a) If Ebola spreads through air, it would not have been possible for any of us to have been alive till now because ultimately, we are all connected by the air we breathe.  
**(b) Trends suggest that only staff members who shook hands with Ebola patients in a hospital got infected by the disease, which spread through the patient’s sweat.**  
(c) According to a WHO study, Ebola spread only to the family members of an infected person and not to anyone else.  
(d) Studies suggest that the people living in the neighbourhood of those suffering from Ebola did not suffer from the disease.

93. b Researcher B says that Ebola gets transmitted through direct contact with the body and bodily fluids of an Ebola patient and is not spread through air. Option (b) gives an example of the same and is therefore, the correct answer. Options (a) and (d) can be eliminated because it is possible that for the disease to spread through air, a certain degree of proximity is required, and therefore, these options do not negate the possibility that Ebola spreads through air. Option (c) is also insufficient as it does not suggest that the people who did not belong to the family of the Ebola patient did not come in direct contact with the patient.

94. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.

- (a) They carried star sensors and plutonium batteries, which were new to exploration, and which suddenly opened space’s outer precincts to human inquiry.  
**(b) They would have thought of it but sending signals through radio waves wasn’t the most efficient method of communication from millions of light years away.**  
(c) Their navigators sat in a faraway place, the Jet Propulsion Laboratory (JPL) in Pasadena, California, where they sent piecemeal instructions to the spacecraft’s steering computers.  
(d) Like the ancient mariners, they would navigate a vast ocean, the solar system, in a path-breaking bid to explore the mysterious outer planets.

94. b While the rest of the statements in the sequence (a), (c) and (d) talk about how some spacecraft would traverse the solar system, option (b) delves into problems with communication. It does not link to the other sentences and hence, is the odd one out. Option (b) is thus, the right answer.

95. Four sentences are given below, labeled (a), (b), (c) and (d). Of these, three sentences need to be arranged in a logical order to form a coherent paragraph/passage. From the given options, choose the one that does not fit the sequence.
- (a) "Maybe it's too much water," he says, fingering clusters of withered yellow leaves on a six-foot-high plant, "Or too much sun."
- (b) Something is killing Ramadhani Juma's cassava crop.
- (c) His cassava fields have fared no better.**
- (d) Juma works a small plot, barely more than an acre, near the town of Bagamoyo, on the Indian Ocean about 40 miles north of Dar es Salaam, Tanzania.
95. c Option (c) is the odd sentence. It unnecessarily repeats the fact that there's something wrong with Juma's cassava crop. Further, it draws a comparison with something else (have fared no better – no better than what?) but that something has not been defined in any of the sentences. The correct sequence is (b), (d) and (a). Option (c) is the right answer.
96. Carol: I don't believe Pablonski will be elected the mayor. I don't think there are many voters who would elect a businessman with no political experience to such a responsible public office.
- Nakamura: You're mistaken. His experience of handling a major corporation is valuable preparation for the job of running a city.
- Nakamura's response reflects that he has interpreted Carol's comments to imply which of the following?
- (a) Candidates with business experience have been elected mayor in the past.
- (b) No candidate without political experience has ever been elected mayor of a city.
- (c) Carol believes that political leadership and business leadership are closely related.
- (d) Voters generally value experience when selecting a candidate.**
96. d Carol predicts that Pablonski will not get elected. Nakamura challenges this, saying "You're mistaken". He further cites Pablonski's experience to support his point. This makes option (d) the correct answer.
97. After much advanced and extremely costly research, a leading chemical company has developed a manufacturing process for converting paper into plastic. According to the company, this new-age plastic can be used for, among other things, notebooks. But what does the company think notebooks used to be made of? This surely has to be a prime example of the mania for advanced technology.
- The author's opinion of the manufacturing process described in the passage is based primarily on the fact that
- (a) plastic is unlikely to be durable enough for high-quality notebooks.
- (b) the research costs involved in developing the process far outweigh any savings possible from using plastic
- (c) a notebook cannot normally be regarded as a high-tech product
- (d) notebooks can be made from paper without converting it into plastic.**
97. d If notebooks can be made from paper, then it isn't necessary to convert paper to plastic in order to make a notebook. This would justify the author's view that this new manufacturing process is unnecessary and is an example of the 'mania for advanced technology'. Thus, option (d) is the correct answer.

98. Social Activist: The high cancer rate in this area is a direct result of the hazardous material produced at your factory.

Company's Lawyer: Our data shows that rates of cancer are high throughout the area in which the factory is located because the natural underground springs that supply drinking water in this area are polluted. The factory or its products are not the cause of higher rates of cancer in the area.

Which of the following, if true, most seriously weakens the lawyer's claims?

- (a) The data does not differentiate between different types of cancer.
  - (b) Nearby communities have not changed their drinking water sources during the last few decades.
  - (c) Cancer-causing chemicals used at the factory are discharged into the soil and seep into the underground springs.**
  - (d) The factory has recently upgraded its machinery and accordingly, its output has increased.
98. c The lawyer claims that the polluted underground springs are the cause of elevated rates of cancer and that the factory and its products have nothing to do with the higher rates of cancer. But option (c) suggests that the factory is responsible for polluting the underground springs. Thus, this option weakens the lawyer's argument and suggests that the factory is indeed responsible for the elevated rates of cancer. Hence, option (c) is the correct answer.

99. In the following question, two statements are given. From among the options, choose the conclusion which follows from the given statements.

Statement I: Some eggs are rotten.

Statement II: No rotten is bad.

- (a) Some eggs are not rotten.
  - (b) Some eggs are not bad.**
  - (c) No eggs are bad.
  - (d) Some eggs are bad.
99. b As per the given statements, those eggs which are rotten cannot be bad since no rotten is bad. Further, statement I tells us that some eggs are indeed rotten. Therefore, these eggs cannot be bad. The other options cannot be concluded. Thus, option (b) is the correct answer.
100. In the following question, a few statements are given. From among the options, choose the option which follows from the given statements.

Statement I: If Ram goes to school, then Shyam must go to college.

Statement II: If Shyam goes to college, Das must go to office.

Statement III: Sheila goes to the mall only if Das goes to office.

Statement IV: If Sheila goes to the mall, Das becomes bankrupt.

- (a) If Ram did not go to school, then Shyam did not go to college.
  - (b) If Das went to office, he must become bankrupt.
  - (c) If Das did not go to office, Ram must not have gone to school.**
  - (d) If Sheila did not go to the mall, Das must not have gone to office.
100. c As per the given statements, whenever Shyam goes to college, Das has to go to office. Thus, if Das did not go to office, then it follows that Shyam did not go to college. But, whenever Ram goes to school, Shyam has to go to college. Thus, if Shyam did not go to college, it follows that Ram did not go to school. Hence, if Das did not go to office, it follows that Ram did not go to school. The other options cannot be concluded. Thus, option (c) is the right answer.