

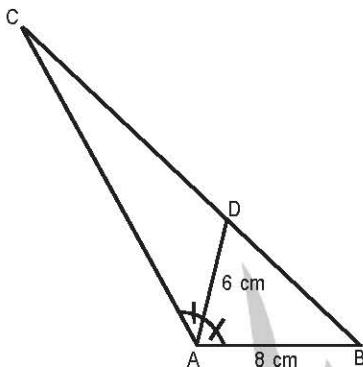
Unproctored Mock-11 2014

Section - I

1. In triangle ABC, the internal angle bisector of $\angle A$ meets BC at point D. If AB = 8 cm, AD = 6 cm and $\angle BAC = 120^\circ$, then what is the length of AC?

(a) 24 cm (b) 12 cm (c) $6\sqrt{3}$ cm (d) None of these

1. a



$$\text{Area of triangle } ABC = \frac{1}{2} \times AB \times AC \times \sin \angle BAC \quad \dots \text{(i)}$$

$$\text{Area of triangle } ABD = \frac{1}{2} \times AB \times AD \times \sin \angle BAD \quad \dots \text{(ii)}$$

$$\text{Area of triangle } ACD = \frac{1}{2} \times AC \times AD \times \sin \angle CAD \quad \dots \text{(iii)}$$

$$\text{Also, } \angle BAD = \angle CAD = \frac{1}{2} \angle BAC = 60^\circ \text{ and (i)} = \text{(ii)} + \text{(iii)}$$

$$\text{Hence, } \frac{1}{2} \times 8 \times AC \times \frac{\sqrt{3}}{2} = \frac{1}{2} \times 8 \times 6 \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times AC \times 6 \times \frac{\sqrt{3}}{2}$$
$$\Rightarrow AC = 24 \text{ cm}$$

2. Ashish, Bimal and Chatur are three friends who come to visit an amusement park. Each of the three is accompanied by his father and his grandfather to the park. In how many ways can these nine people stand in the queue at the entry gate if no father wants to stand ahead of his son in the queue?
- (a) ${}^9C_3 {}^6C_3$ (b) ${}^9C_3 {}^6P_3$ (c) ${}^9P_3 {}^6C_3$ (d) None of these
2. a We can say that there are 9 positions in the queue. Let us first select 3 positions for Ashish, his father and his grandfather. This can be done in 9C_3 ways. There is only one way in which these 3 people can occupy the 3 positions. Now let us select 3 positions out of the remaining 6 for Bimal, his father and his grandfather. This can be done in 6C_3 ways.
- Now we are left with just 3 positions which are to be occupied by Chatur, his father and his grandfather and again there is just one way of doing it.
- Hence, the answer = ${}^9C_3 {}^6C_3$
3. If $N = 1! - 2! + 3! - 4! + \dots + 47! - 48! + 49!$, then what is the unit digit of N^N ?
- (a) 0 (b) 9 (c) 7 (d) 1
3. d The unit digit of every term from $5!$ to $49!$ is 0.
Also, $1! - 2! + 3! - 4! = 1 - 2 + 6 - 24 = -19$.
Hence, the unit digit of N will be $10 - 9 = 1$.
The unit digit of N^N will also be 1.
4. P and Q are two opposite ends of a straight running track. Ria and Tia start running towards each other simultaneously from P and Q respectively. As soon as any of them reaches an end, she turns back and starts running towards the other end. Their first meeting happens at a point 210 m away from P and the second meeting happens at a point 150 m away from Q. If the speeds (in m/s) of Ria and Tia are x and y respectively, such that $2x > y > x$, then what is the distance between P and Q?
- (a) 420 m (b) 480 m (c) 540 m (d) Cannot be determined

4. b As their speeds are x and y such that $2x > y > x$, we can conclude that at the time of the first two meetings Ria and Tia must be running in opposite directions.
Let M and N be their first and second meeting points respectively. Let the total distance between points P and Q be 'd'.



- I: When Ria and Tia meet for the first time, the distance covered by Ria = d_1 .
II: When Ria and Tia meet for the second time, the distance covered by Ria after the first meeting = $(d_2 + d_3 + d_3)$.
Since the time gap between the first two meetings should be double of the time taken for the first meeting,
 $2d_1 = d_2 + d_3 + d_3$.
 $\Rightarrow 420 = d_2 + 300$ or $d_2 = 120$ m.
 $\Rightarrow d = d_1 + d_2 + d_3 = 480$ m.

5. Consider the following two curves in the x-y plane:

$$y = x^4 + 2x^3 + 4x - 8$$

$$y = 2x^3 + 2x^2 + 4x$$

Which of following statements is true for $0 \leq x \leq 5$?

(a) The two curves intersect once.

(b) The two curves intersect twice.

(c) The two curves do not intersect.

(d) The two curves intersect four times.

5. a Let the two curves intersect at (h, k) . Hence,
 $k = h^4 + 2h^3 + 4h - 8 = 2h^3 + 2h^2 + 4h$

$$\Rightarrow h^4 - 2h^2 - 8 = 0$$

$$\Rightarrow h^2 = 4 \text{ or } -2$$

As $h^2 > 0$, we get $h = 2$ or -2 .

Hence, the two curves intersect only once for

$$0 \leq x \leq 5.$$

Directions for questions 6 to 8: Answer the questions on the basis of the information given below.

Six teams, from six different states, participated in a Hockey tournament. Each match was played in the home state of one of the two participating teams. The team which belongs to the state in which a match is played is called the Home Team and the other team is called the Visiting Team.

The table given below shows the number of matches won by each team against each of the rest of the five teams in its home state. E.g. 12 matches were played between Atlanta Hawks and Boston Celtics in the home state of Atlanta Hawks, of which Atlanta Hawks won 8 matches and Boston Celtics won the rest 4 matches. No match ended in a draw in the tournament.

Visiting Team Home Team	Atlanta Hawks	Boston Celtics	Chicago Bulls	Denver Nuggets	Indiana Pacers	LA Lakers
Atlanta Hawks	—	8/12	7/9	5/9	4/7	2/10
Boston Celtics	7/10	—	5/8	2/5	6/7	4/8
Chicago Bulls	6/7	9/11	—	8/9	4/5	5/6
Denver Nuggets	3/6	5/12	4/8	—	7/9	1/10
Indiana Pacers	5/6	6/9	3/7	7/10	—	7/12
LA Lakers	9/10	7/7	8/11	5/6	6/9	—

The points were awarded after a match as per the rules given below.

- (i) No point was awarded to a team for losing a match in its home state.
 - (ii) One point was awarded to a team for losing a match in a state other than its home state.
 - (iii) Two points were awarded to a team for winning a match in its home state.
 - (iv) Three points were awarded to a team for winning a match in a state other than its home state.
6. If the team which scored the maximum number of points among the six teams was declared the winner of the tournament, then which team finished as first runner up in the tournament?
 (a) LA Lakers **(b) Chicago Bulls** (c) Boston Celtics (d) Indiana Pacers
7. How many points were scored by the team which lost the maximum number of matches in its home state among the six teams in the tournament?
 (a) 109 (b) 113 **(c) 103** (d) None of these
8. The number of matches lost by Indiana Pacers in states other than its home state form what percentage of the total matches played by Indiana Pacers?
 (a) 10% (b) 16.67% (c) 25% **(d) 33.33%**

For questions 6 to 8:

The table given below shows:

- (i) The number of matches lost and the number of matches won by each team in its home state.
- (ii) The number of matches lost and the number of matches won by each team in states other than its home state.
- (iii) The total points scored by each team.

Team	The number of matches played in its home state		The number of matches played in states other than its home state		Total Points
	Lost	Won	Lost	Won	
Atlanta Hawks	21	26	30	9	109
Boston Celtics	14	24	35	16	131
Chicago Bulls	6	32	27	16	139
Denver Nuggets	25	20	27	12	103
Indiana Pacers	16	28	27	10	113
LA Lakers	8	35	19	27	170

6. b Chicago Bulls finished as first runner up in the tournament.
7. c Denver Nuggets lost the maximum number of matches in its home state among the six teams and finished with a total of 103 points in the tournament.
8. d The total number of matches played by Indiana Pacers = 81
 The number of matches lost by Indiana Pacers away from its home state = 27

$$\text{Required percentage} = \frac{27}{81} \times 100 = 33.33\%$$

9. $A = k^2 - 1$ and $B = (k + 1)^2 - 1$, where k is a natural number greater than 1. How many prime numbers are there by which both A and B are divisible for at least one value of k ?
 (a) 0 (b) 1 (c) 2 (d) More than 2

$$9. \text{ b} \quad A = (k - 1)(k + 1) \\ B = k(k + 2)$$

For all values of k greater than or equal to 2, the natural numbers ' $k - 1$ ' and ' $k + 1$ ' are coprime with both ' k ' and ' $k + 2$ ' except when ' $k - 1$ ' and ' $k + 2$ ' are both multiples of 3.

Note that $(k+2) - (k-1) \equiv 3$.

Here, the common factor of A and B, which is also a prime number.

E.g. when $k =$

10. d Let the roots be α and 2α .

$$\text{Sum of the roots} = \alpha + 2\alpha = 3\alpha = -b \quad \dots (i)$$

$$\text{Product of the roots} = \alpha \times 2\alpha = 2\alpha^2 = 2b \quad \dots \text{(ii)}$$

Dividing equation (ii) by equation (i), we get

$$\alpha = -3 \text{ and } b = 9.$$

The equation whose roots are 9 and 10 is $x^2 - 19x + 90 = 0$.

11. A 1-litre water-alcohol mixture M_1 contains 40% water while another 1-litre water-alcohol mixture M_2 contains 70% water. x ml is taken out from each of the two mixtures and put in two separate containers. The quantity taken out from M_1 is mixed into the remaining part of M_2 and the quantity taken out from M_2 is mixed into the remaining part of M_1 . If the two mixtures contain equal quantities of water after the operation, then what is the value of x ?
(a) 300 (b) 400 (c) 500 (d) 600

11. c Amount of water initially in 1000 ml of M_1 = 400 ml
 Amount of water initially in 1000 ml of M_2 = 700 ml

Amount of water initially in 1000 ml of M_2 = 700 ml
 Amount of water left in M_2 when v ml is taken out.

Amount of water left in M_1 when x ml is taken out = $(400 - 0.4x)$ ml

Amount of water left in M_2 when x ml is taken out = $(700 - 0.7x)$ ml
 Amount of water in M_1 when x ml from M_2 is added = $400 + 0.4x$ ml

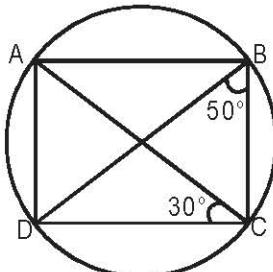
$$\text{Amount of water in } M_1 \text{ when } x \text{ ml from } M_2 \text{ is added} = 400 - 0.4x + 0.7x = 400 + 0.3x.$$

According to the information given in the question, $100 + 0.3x = 700 - 0.3x$ or $x = 500$.

According to the information given in the question, $400 + 0.3x = 700 - 0.3x$ or $x = 500$.

12. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:
- Mark (a) if the question can be answered by using Statement A alone, but cannot be answered by using Statement B alone.
- Mark (b) if the question can be answered by using Statement B alone, but cannot be answered by using Statement A alone.
- Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
- Mark (d) if the question can be answered by using either statement alone.**

Q. ABCD is a quadrilateral inscribed in a circle. What is the measure of $\angle BAC$?



- A. AB is parallel to CD.
B. $\angle BDC$ is thrice of $\angle BCA$.

12. d **From Statement A:**

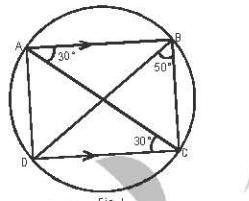


Fig. I

As $AB \parallel CD$ and AC is the transversal,
 $\angle BAC = \angle ACD = 30^\circ$
 (Alternate angles)
 Thus this statement alone is sufficient to answer the question.

From Statement B:

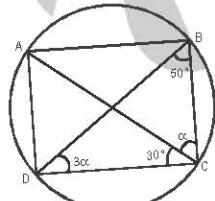


Fig. II

In $\triangle BCD$, we have $\angle BCD + \angle CDB + \angle DBC = 180^\circ$

Let $\angle BCA$ be α , therefore, $\angle BDC = 3\alpha$

$$\Rightarrow 4\alpha + 80^\circ = 180^\circ$$

$$\Rightarrow \alpha = 25^\circ$$

Now, $\angle BAC = \angle CDB = 3\alpha = 75^\circ$

(Angles subtended by the same arc)

Thus this statement alone is sufficient to answer the question.

13. Given below is the sequence of all the natural numbers which don't contain the digit '0'.

1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13...

What is the 200th term of this sequence?

(a) 242

(b) 241

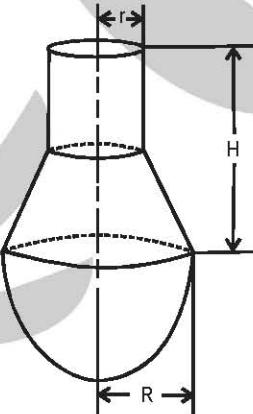
(c) 255

(d) 253

13. a In the first 200 natural numbers there are 20 numbers whose unit digit is '0', there are 11 numbers whose tens digit is '0' and there are 2 natural numbers which have both the unit and the tens digit as '0'. So in all there are $200 - (20 + 11 - 2) = 171$ such numbers which do not have '0' as any digit.

The 172nd, 181st, 190th and 199th term of the given sequence will be 211, 221, 231 and 241 respectively. So the 200th term will be 242.

14. The shape of a solid plastic toy is shown in the figure given below. The structure consists of a cylinder, frustum of a cone and a hemisphere. The height and radius of the cylinder are $H/2$ and r respectively. The radius of the hemisphere is R . The height and base radius of the original cone were H and R respectively. If $H = 2R = 4r$, then what is the volume of the toy?



(a) $12\pi r^3$

(b) $24\pi r^3$

(c) $12\pi R^3$

(d) $24\pi R^3$

$$14. \text{a} \quad \text{Volume of the cylinder} = \pi r^2 \left(\frac{H}{2} \right) = 2\pi r^3$$

Volume of the frustum

$$= \frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 \left(\frac{H}{2}\right) = \frac{16}{3}\pi r^3 - \frac{2}{3}\pi r^3 = \frac{14}{3}\pi r^3$$

$$\text{Volume of the hemisphere} = \frac{2}{3}\pi R^3 = \frac{16}{3}\pi r^3$$

$$\text{Volume of the toy} = \left(2 + \frac{14}{3} + \frac{16}{3}\right)\pi r^3 = 12\pi r^3$$

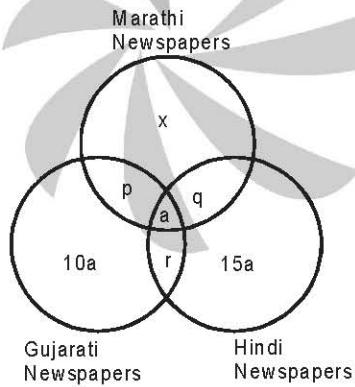
Directions for questions 15 and 16: Answer the questions on the basis of the information given below.

In a society, the newspapers of only three languages – Marathi, Gujarati and Hindi – are distributed. Each family residing in the society reads newspapers of at least one of the three languages.

The total number of families reading newspapers of exactly one language can be divided into three types – only Marathi, only Gujarati and only Hindi. These three numbers are in A.P., in no particular order. Similarly, the three types of families reading newspapers of exactly two languages are also in A.P. The number of families reading newspapers of all the three languages is one-tenth of the number of families reading only Gujarati newspapers, which in turn is two-third of the number of families reading only Hindi newspapers. The number of families reading both Marathi and Gujarati newspapers is 15, whereas the number of families reading both Gujarati and Hindi newspapers is 19. The number of families reading Hindi newspapers is 70, which is more than the number of families reading Marathi newspapers.

For questions 15 and 16:

The situation given in the question can be shown with the help of a Venn diagram.



Let p , q , and r be equal to $k - d$, k and $k + d$, not necessarily in the same order.

We have,

$$\begin{aligned} a + 15a + q + r &= 70 & \dots(i) \\ a + p &= 15 & \dots(ii) \\ a + r &= 19 & \dots(iii) \end{aligned}$$

Adding (i) and (ii), we get

$$17a + p + q + r = 85$$

$$17a + 3k = 85$$

The only possible values of 'a' and 'k' are 2 and 17.

Therefore, $p = 13$, $q = 21$ and $r = 17$.

As the number of families reading Hindi newspapers is more than those reading Marathi newspapers, the number of families reading only Marathi newspapers is either 10 or 25.

15. d The total number of families in the society is either 113 or 128.
16. c The number of families reading both Marathi and Hindi newspapers is 23.
17. Four identical bags are distributed among four boys. If each boy can get any number of bags then what is the probability that no boy gets more than two bags?

(a) $\frac{18}{35}$

(b) $\frac{2}{7}$

(c) $\frac{19}{35}$

(d) $\frac{16}{35}$

17. c The total number of ways of distributing the bags, using the formula for distribution
 $= 4 + 4 - 1C_{4-1} = 7C_3 = 35$.

Let us find the number of ways of distribution in which no boy gets more than 2 bags.

(i) Each boy gets one bag:

The number of ways = 1

(ii) One boy does not get any bag, one boy gets two bags and two boys get one bag each:

The boy who does not get any bag can be selected in 4C_1 ways while the one who gets two bags can be selected in 3C_1 ways.

The number of ways = ${}^4C_1 \times {}^3C_1 = 12$

(iii) Two boys do not get any bag and two boys get two bags each:

The two boys who do not get any bag can be selected in 4C_2 ways.

The number of ways = ${}^4C_2 = 6$

The total number of ways = $1 + 12 + 6 = 19$

Hence, the answer = $\frac{19}{35}$.

18. $4 \leq p \leq 9$, $-0.25 \leq q \leq 0.36$, $-0.49 \leq r \leq -0.01$ and $\frac{r}{s^2} = \frac{p^2}{q}$, where p , q , r and s are real numbers.

What is the difference between the maximum and the minimum possible values of s ?
(a) 0.0875 (b) 0.105 (c) 0.210 (d) None of these

18. d $\frac{r}{s^2} = \frac{p^2}{q}$

$$\Rightarrow qr = p^2 s^2$$

But as $-0.49 \leq r \leq -0.01$,
we must have $q \leq 0$ or $-0.25 \leq q \leq 0$.

$$s^2 = \frac{qr}{p^2}$$

$$\text{Maximum possible value of } s^2 = \frac{(-0.25)(-0.49)}{4^2}$$

Maximum and minimum possible values of s are 0.0875 and -0.0875 respectively.

Hence, the answer = $2 \times 0.0875 = 0.175$.

19. The work done by 2 men in a day is equal to the work done by 3 children in a day. The work done by 3 men in a day is equal to the work done by 5 women in a day. It takes 10 days for a man, a woman and a child to complete a job working together. How many days will 2 children working together take to complete the same job?

(a) 30 (b) 15 (c) 17 (d) 34

19. c Let the number of units of work completed by a man, a woman and a child in one day be M , W and C respectively. Hence, $2M = 3C$ and $3M = 5W$.

Let $M = 15U$. Hence, $C = 10U$ and $W = 9U$.

The amount of work completed by a man, a woman and a child together in 10 days = $10(15U + 10U + 9U) = 340U$. The amount of work completed by 2 children in a day = $20U$.

Hence, the answer = $\frac{340}{20} = 17$ days.

20. Two circles of radii 6 cm each have their centers at O and O' respectively. The circles intersect at points M and N, and pass through the centers of each other. A point P is taken on the minor arc OM. The points N and P are joined and the line segment NP is extended to meet the circle with center O at point Q. If PQ = 4 cm, what fraction of the area of the circle with center O is occupied by the triangle MPQ?

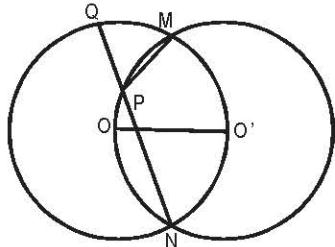
(a) $\frac{\sqrt{3}}{4\pi}$

(b) $\frac{\sqrt{3}}{9\pi}$

(c) $\frac{\sqrt{3}}{6\pi}$

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

20. b



$$\triangle MOO' \cong \triangle NOO'$$

(Since all the sides are equal.)

$$\therefore \angle MON = \angle MO'N = 120^\circ$$

Minor arc MN subtends $\angle MON$ at the center and $\angle MQN$ at circumference.

$$\therefore \angle MQN = 60^\circ \quad \dots \text{(i)}$$

(The angle subtended by an arc at the centre is twice the angle subtended by the arc at circumference.)

Now, in circle with center O', major arc MN subtends $\angle MON$ and $\angle MPN$ at circumference.

$$\therefore \angle MON = \angle MPN = 120^\circ$$

$$\Rightarrow \angle MPQ = 60^\circ \quad \dots \text{(ii)}$$

From equations (i) and (ii), $\triangle MPQ$ is an equilateral triangle.

$$\text{Hence, the required fraction} = \frac{\frac{\sqrt{3}}{4} \times 4^2}{\pi 6^2} = \frac{\sqrt{3}}{9\pi}.$$

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

Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.

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

Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.

Mark (d) if the question cannot be answered even by using both the statements together.

Q. Two cars, 100 km apart, start moving towards each other. After how much time will they meet?

- A. The ratio of the speeds of the two cars is 3 : 7.
B. The slower car is travelling at a speed at which it will cover a distance of 600 km in 10 hours.

21. c From Statement A:

The ratio of the speeds is given. With the help of this we can determine the respective distance covered by them till the moment they meet but cannot determine the time taken by them to meet.

Thus this statement alone is not sufficient to answer the question.

From Statement B:

No information regarding the speed of the faster car is given.

Thus this statement alone is not sufficient to answer the question.

From Statements A and B:

Let the speed (in km/hr) of the two cars be $3x$ and $7x$.

$$\therefore 3x \times 10 = 600 \Rightarrow x = 20$$

We can determine the speeds of the two cars and hence the time taken by them to meet.

22. d As the larger number is written on the left, the larger number is either 54 or 55.
Let the smaller number be x .

Case I: The larger number is 54.

$$5400 + x = 5481 + 54 - x$$

$$2x = 5535 - 5400 = 135$$

(In this case x will not be a natural number.)

Case II: The larger number is 55.

$$5500 + x = 5481 + 55 - x$$

$$2x = 5536 - 5500 = 36$$

$$\Rightarrow x = 18$$

Hence, the required sum = 73.

23. How many integer pairs (x, y) are there such that $x^3 + 3x^2 - 4x = 81y^3 - 9y^2 + 6y - 1$?

(a) 0

(b) 1

(c) 2

(d) 3

23. a L.H.S.

$$= x^3 + 3x^2 - 4x$$

$$= x(x^2 + 3x - 4)$$

$$= x(x - 1)(x + 4)$$

$$= x(x - 1)(x + 1 + 3)$$

$$= (x - 1)x(x + 1) + 3x(x - 1)$$

As the product of three consecutive integers is divisible by 3, the L.H.S. of the equation is always divisible by 3.

R.H.S.

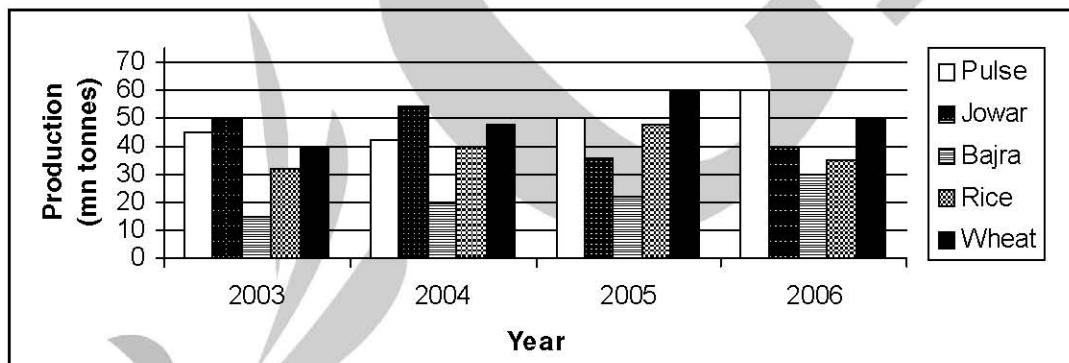
$$= 81y^3 - 9y^2 + 6y - 1$$

The R.H.S. of the equation is not divisible by 3.

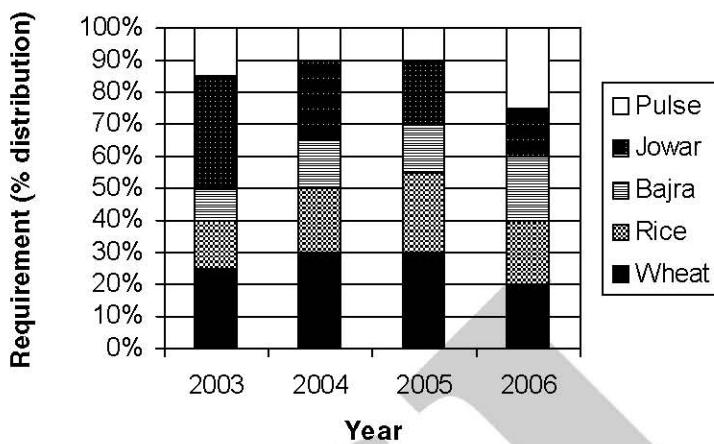
Hence, no solution is possible.

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

Pekoslovakia produces just five commodities every year. If the production of a commodity in a year is more than its requirement then it is exported whereas if the production is less than its requirement then it is imported. The graph given below shows the volume of production (in mn tonnes) of the five commodities in Pekoslovakia from the year 2003 to the year 2006.



The total requirement of the five commodities together in 2003 was 200 mn tonnes; it increased by 20% in 2004 over 2003; then remained constant in 2005; and then finally increased by 25% in 2006 over 2005. The graph given below shows the percentage requirement of each commodity as a part of the total requirement in each of the four years.



For questions 24 to 26: The table given below shows the value (in mn tonnes) of the Production (P) and the Requirement (R) of various commodities in Pekoslovakia from 2003 to 2006.

	2003		2004		2005		2006	
	P	R	P	R	P	R	P	R
Pulse	45	30	42	24	50	24	60	75
Jowar	50	70	54	60	36	48	40	45
Bajra	15	20	20	36	22	36	30	60
Rice	32	30	40	48	48	60	35	60
Wheat	40	50	48	72	60	72	50	60
Total	182	200	204	240	216	240	215	300

24. d 2006

25. a 2003

26. a 1

27. $A = 28^{12}$, $B = 18^8$ and $C = 21^6$. How many natural numbers are there by which at least one among A, B and C is divisible?
 (a) 499 (b) 501 (c) 504 (d) 505

$$27. \text{ d } A = 28^{12} = 2^{24} \times 7^{12}$$

$$B = 18^8 = 2^8 \times 3^{16}$$

$$C = 21^6 = 3^6 \times 7^6$$

The total number of factors of A will be $(24 + 1)(12 + 1) = 325$.
 Similarly, the total number of factors of B and C will be 153 and 49 respectively.

Case I: Factors common to A, B and C.

Case I: Factors common

The only factor common to A, B and C is 1.

Case II: Factors common to exactly two among A, B and C.

Factors common to A and B = $2^0, 2^1, \dots, 2^7, 2^8$

Factors common to A and B = $2^0, 2^1, \dots, 2^4, 2^5$

Factors common to A and C = $7^0, 7^1, \dots, 7^5, 7^6$

Hence, the answer

$$= (325 + 153 + 49) - (9 + 7 + 7) + 1 = 505.$$

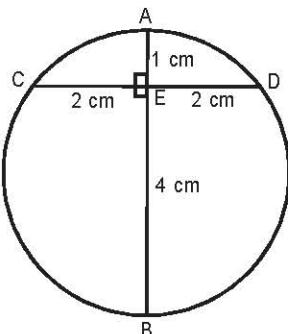
28. It takes 30 hours for an inlet pipe to fill an empty tank completely. When 5 identical inlet pipes and 4 identical outlet pipes operate together, the same empty tank get filled completely in 10 hours. How much time (in hours) will an outlet pipe take to empty the same tank when it's filled upto half its volume?

28. d Let the volume filled (in units) by an inlet pipe in an hour = V.
The total volume (in units) of the tank = $30V$.
Let the volume emptied (in units) by an outlet pipe in an hour = U.
Hence, $10(5V - 4U) = 30V$ or $V = 2U$.

The time taken by an outlet pipe to empty 15V volume = $\frac{15V}{U}$ = 30 hours.

29. The chord AB of a circle is the perpendicular bisector of the chord CD of the same circle. The two chords intersect at point E. If CD = BE = 4 cm, then what is the circumference of the circle?
- (a) 4π cm (b) **5π cm** (c) 6π cm (d) 8π cm

29. b $AE \times BE = CE \times DE$.
Hence, $AE = 1$ cm.
The perpendicular bisector of any chord of a circle must pass through its centre.



Hence, AB also passes through the centre of the circle and is the diameter of the circle.
 $AB = AE + BE = 1 + 4 = 5$ cm.
 Circumference of the circle = 5π cm.

30. What is the number of ways in which a team of 3 members can be selected from 4 boys and 6 girls such that there is at least one boy and at least one girl in the team?

- (a) ${}^4C_1 {}^6C_1 {}^8C_1$ (b) $\frac{{}^4C_1 {}^6C_1 {}^8C_1}{2}$ (c) ${}^{10}C_3$ (d) None of these

30. b **Case I:**
 2 boys and 1 girl is selected in the team.
 The number of ways = ${}^4C_2 {}^6C_1$

Case II:
 1 boy and 2 girls are selected in the team.
 The number of ways = ${}^6C_2 {}^4C_1$

$$\text{The total number of ways} = {}^4C_2 {}^6C_1 + {}^6C_2 {}^4C_1 = 96 = \frac{{}^4C_1 {}^6C_1 {}^8C_1}{2}$$

Section - II

Directions for questions 31 and 32: The passage given below is followed by a set of two questions. Choose the most appropriate answer to each question.

The spiritual interlocutor interacts without preconceived notions. The good discussant receives without barriers and responds in a heightened state of understanding. The shedding of constructs becomes at once a spiritual and humanist pursuit. Most of us, by force of sub-conscious habit, introduce our experiential and intellectual baggage into our interactions with people. This not only distorts our understanding of the material reality, but inhibits our spiritual growth as well. We stew in our 'here and now' boxes, unable to elevate ourselves as a bird would.

Yet, the validity of experience should not be discounted. Experience should be assessed with a certain heightened objectivity for one to draw the right lessons for one's actions. So detachment should be seen as a means to arrive at that state of balanced understanding. It does not preclude pain and compassion; but it discards obfuscation and hypocrisy.

Creativity is said to spring from the angst of experience. Often the outpourings of a tortured mind make for great literature and painting. Ironically, existential pain can bring about work of transcendental quality. The beauty and simplicity of Kahlil Gibran's The Prophet is testimony to the literary virtues of spiritualism. The spiritual world is a rich, fulsome, loving nothingness that opens up the heavens, not a musty blankness.

Compassion could liberate us from the boundaries of the mind. The house-holder looks after the family out of a sense of duty and affection, which in due course becomes second nature. The mental and emotional universe of such an individual is able to accommodate reality in virtually all its dimensions. Psychologist Eric Fromm points out that love must be all-encompassing by nature for an individual to be spiritually liberated. To love some people and resent others is not real love.

31. Which of the following will be a suitable title for the passage?
 - (a) Spiritual Equality
 - (b) Limitations of the Intellectual
 - (c) Creativity and Spirituality
 - (d) Being Spiritual**

31. d The passage highlights the various aspects to following a spiritual path. The author also provides characteristics of different kinds of spiritualists – the spiritual interlocutor, the creative and the one with compassion. It can thus also be inferred that the author is speaking about different spiritual types. Option (d) is the answer and implies a plural context too. Option (a) is incorrect as this forms only a part of the passage. The author does not discuss the limitations of the intellectual, though he does refer to the boundaries of the mind. This renders option (b) incorrect. Option (c) can be ruled out as this is not the main idea but only an example given to substantiate the main idea.

32. "It does not preclude pain and compassion; but it discards obfuscation and hypocrisy." When paraphrased, how will the given sentence read?
- (a) Experience does not prevent pain and compassion but rejects disguise and insincerity.
 - (b) Detachment does not prevent pain and compassion but rejects disguise and insincerity.
 - (c) Detachment does not prevent pain and compassion but rejects complication and pretense.**
 - (d) Experience does not prevent pain and compassion but rejects complication and pretense.

32. c One should not try to solve this question merely on the basis of the meanings of the words given in the passage as the answer is expected to convey the correct semantics intended by original text.

The answer can be found in the second paragraph. The selected line refers to detachment that has been spoken of in the previous sentence. Experience is not the reference point for the selected line. Options (a) and (d) can thus be ruled out. The use of the conjunction "but" indicates dissimilarities between the first and second halves of the sentence. Pain is linked with obfuscation and compassion with hypocrisy. While paraphrasing, 'obfuscation' would not convey the meaning of disguise. Option (b) is incorrect as it brings in disguise (which does not help prevent pain). Option (c) correctly paraphrases to say that detachment does not prevent pain but rejects complication (which can give rise to pain) and it does not prevent compassion but rejects pretense (which can prevent compassion).

Directions for questions 33 to 35: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

A sensible and fair approach would be to let the high-end tax cuts expire as scheduled, but keep the other tax cuts for another year. That would keep more cash in the hands of people most likely to spend it and prop up consumer demand while the economy is weak. It would give Congress and the administration time to undertake tax reform.

Most Congressional Republicans are willing to embrace reform, but only if it is "revenue neutral." There is no question that the system is overly complicated; it is also riddled with hugely costly special deals for special interests. Any reform must streamline the code, make it fairer and — most important — raise more revenue.

Each year, the government provides \$1 trillion in tax breaks. Some of the largest breaks — for itemized deductions and retirement savings — should be retained because they subsidize important goals, like home ownership and old-age security. Right now, wealthier taxpayers get the greatest benefit. The process needs to be reformed so that most of the help flows to those who most need it: low- and middle-income taxpayers.

At the same time, super-low tax rates for investment income should be ended. Capital gains are taxed at a top rate of 15 percent, compared with a top rate for wages and salary of 35 percent. Proponents argue that the lower rate is an incentive to invest, but research shows that it also encourages gaming of the system. Tax breaks that have outlived their purpose must be ended, starting with subsidies for the oil industry, which is making billions in profits.

The revenue from such reforms could be used to pay down the deficit and allow all tax rates to be lowered, improving incentives to work. The amount of revenue raised and the drop in tax rates will depend on how much tax breaks are curbed.

Congress should consider raising revenues in other ways, like a value-added tax, or carbon taxes. That way all of the needed revenue for deficit reduction, and for what government provides, does not need to be squeezed from the income tax. A value-added tax is conducive to saving, and a carbon tax helps protect the environment.

The public is open to new taxes, and the economic facts are clear. Until tax increases are considered in equal measure to spending cuts, there will be no budget fix.

33. What is the tone of the passage?
(a) Placatory **(b) Advisory** (c) Premonitory (d) Critical
33. b Every paragraph in the passage has a line that provides advice on what the government should do with reference to tax reforms. The tone of the author is advisory. Option (a) is ruled out, as the author is not trying to calm or appease the audience. Option (c) is incorrect as the author does not predict about the issue dealt in the passage. Option (d) can be ruled out because the author is not trying to criticize the government; instead he is providing possible solutions and advice.
34. Which of the following can be inferred from the passage?
(a) The current tax structure does not give the greatest benefit to low- and middle-income taxpayers.
(b) The current tax structure aims to give the greatest benefit to low- and middle-income taxpayers.
(c) Tax breaks give the greatest benefit to wealthier taxpayers.
(d) The current tax structure does not give the greatest benefit to wealthier taxpayers.
34. a The last lines of the third paragraph state that, "Right now, wealthier taxpayers get the greatest benefit. The process needs to be reformed so that most of the help flows to those who most need it: low- and middle-income taxpayers." This implies option (a). Option (b) goes against the information in the passage. Option (c) is incorrect as the author states that the current tax break gives the greatest benefit to wealthier taxpayers. This cannot be generalized for all tax breaks. Option (d) is incorrect as it goes against the information in the passage.
35. Which of the following can be inferred from the last sentence of the passage?
(a) Tax increase will give Congress and the administration time to undertake tax reforms.
(b) The economy can be strengthened if more importance is given to tax increases.
(c) The economy can be strengthened if less importance is given to spending cuts.
(d) The economy can be strengthened with equal importance given to tax increases and spending cuts.
35. d The fifth paragraph of the passage states that more revenues are needed and these can be obtained from other forms of taxation or through tax increases. However, the last line of the passage also states that, "Until tax increases are considered in equal measure to spending cuts, there will be no budget fix." This line implies that equal importance must be given to both tax increases and spending cuts and not only to either one. This rules out options (b) and (c). Option (a) can be ruled out, as there is no implication in the passage towards this assertion. Option (d) best sums up the inference from the last sentence of the passage.

36. The question given below is followed by two statements, A and B. Mark the answer using the following instructions:
Mark (a) if the question can be answered by using one of the statements alone, but cannot be answered by using the other statement alone.
Mark (b) if the question can be answered by using either statement alone.
Mark (c) if the question can be answered by using both the statements together, but cannot be answered by using either statement alone.
Mark (d) if the question cannot be answered even by using both the statements together.

Q. A program is telecasted on a channel in five different languages – Hindi, English, Tamil, Malayalam and Telugu – in five consecutive time slots, not necessarily in the same order. What is the language in the third slot?

- A.** Hindi is either in the second or in the fourth slot. Tamil is not in the first slot.
B. English and Malayalam are in two consecutive slots. Telugu is neither in the first nor in the last slot.

36. c **From Statement A:**

The statement alone is clearly not sufficient to answer the question.

From Statement B:

The statement alone is clearly not sufficient to answer the question.

From Statements A and B:

Left to Right – Language in the first to the last slot				
English/ Malayalam	Malayalam/ English	Telugu	Hindi	Tamil

37. 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 one.
- A. But instead the administration went into fight mode, ordering federal employees not to look at the cables at work or at home.
B. Thus the attempts to block or close down the website, even going so far as to call for the assassination of WikiLeaks founder Julian Assange.
C. These are symptoms of a weak, failing culture, unable to deal with its own history.
D. The administration doesn't want government workers and troops and ordinary citizens to see how their political sausage is made.
E. Censorship is always a bad move.

(a) ABEDC

(b) AEDBC

(c) ADBCE

(d) ACDBE

37. b AEDBC

BC forms a logical link as C comments on certain actions that have been taken and calls them symptoms of a weak and failing culture. Statement A states an action. However, AC is not a logical flow, as C is a comment on the entire situation and works well as an ending sentence. DB is also a link as D gives the reason and B the result/action taken. The link thus is DBC. Statement E can be confused for an ending sentence, however, it will provide a disjoint ending. It fits in best after A as it comments on the 'action of censorship' mentioned in A. Also ED is linked as D starts the explanation on why censorship is bad.

38. 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 one.
- A. We surely need a much smarter long-term fiscal plan.
 - B. We need to cut spending in areas and on a time schedule that will hurt the least.
 - C. We need to raise taxes in ways that will hurt the least.
 - D. We need to use some of these revenues to invest in the pillars of our growth.
 - E. We need to offer every possible incentive to get our countrymen to start new businesses to grow out of this hole.

(a) ABCDE

(b) ACEDB

(c) ACEBD

(d) ADCBE

38. a ABCDE

The question can be solved by options. Sentence A starts the discussion. Sentence D mentions the word 'these revenues' and only C presents a logical source of revenue making CD a mandatory pair. This leads to option (a).

39. 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 one.

- A. Ostensibly a member of the Congolese Army, he is in fact a freelance killer with his own ethnic Tutsi militia.
- B. All this might be a price worth paying if the law were having its intended effect.
- C. Meanwhile, the law is benefiting some of the very people it was meant to single out.
- D. The chief beneficiary is Gen. Bosco Ntaganda, who is nicknamed The Terminator.
- E. They provide "security" to traders smuggling minerals across the border to neighboring Rwanda.

(a) ACDEB

(b) DAEBC

(c) CDAEB

(d) BEACD

39. c CDAEB

There is a link between DA – the noun-pronoun link. Options (a) and (d) can be ruled out based on this. Also there is a link between C and D as the latter specifies the chief beneficiary. This helps us to establish the CDA link. 'Militia' means a group of people who are not professional soldiers but who have had military training and can act as an army. The pronoun 'they' in E refers to Gen. Bosco Ntaganda and his Tutsi militia. Thus, AE is a mandatory pair. Sentence B is best suited as a closing sentence. Hence, option (c) is the correct option.

Directions for questions 40 to 42: Answer the questions on the basis of the information given below.

A bus left Terminal A for Terminal B and passed through seven bus stops on its way – P, Q, R, S, T, U and V – not necessarily in the same order. The distance between any two consecutive bus stops was the same. The bus always moved with a constant speed, which was either v m/s or $2v$ m/s, between two consecutive bus stops. It was also noticed during the journey that:

- (i) The time taken by the bus to reach S from P was the same as the time taken to reach Q from T.
- (ii) There was exactly one bus stop between S and V.
- (iii) The distance between P and Q was the same as that between Q and T.
- (iv) U was not the first bus stop and R came after U.

For questions 40 to 42:

Let us try to write the possible arrangements of the bus stops by writing them in a row (left to right means first to last). From statements (i) and (iii) we can say that Q was exactly in the middle of P and T and the order of the three was 'T Q P'.

Case I: There were two bus stops between T and Q.

T Q P

This violates statement (i) which states that the bus reached S from P.

Case II: There was exactly one bus stop between T and Q.

(a) T - Q - P - -

Only one arrangement is possible:

TUQVPSR

(b) T Q P

This violates statements (i) and (iv) combined.

(c) ---T---Q---P

This violates statement (i) which states that the bus reached S from P.

Case III: There was no bus stop between T and Q.

(a) T Q P

Two arrangements are possible:

T Q P S U V R and

T Q P U S R V

These violate statement (iv) and statement (ii) respectively.

(d) T Q P and (e) T Q P

These violate statements (i) and (ii) combined.

The only possible arrangements are:

I: TUQVPSR

II: TQPSUVR

III: TQPUSRV

40. a T was definitely the first bus stop among the seven.

41. d The last bus stop among the seven was either R or V.

42. b The time taken by the bus to travel from P to S and from T to Q was the same. But the average speed of the bus was different in the two cases. Hence, the distance between P and S was not the same as that between T and Q. This is followed by arrangements I and III. For both the arrangements the bus stop immediately before R was S.

43. 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.

A key tipping point for this decades-long class warfare of the rich vs. the working class can be found in President Reagan's decision to break the air traffic controllers' union when it initiated a strike in 1981. Reagan's manoeuvre was an audacious gamble to head backwards in terms of economic and social justice, and it paid off. The weak, disorganized Left at the time was unable to mount a concerted, effective campaign against Reagan's union-busting move, and the public didn't seem to care.

(a) The lesson was learned: going backwards works.

- (b) Compare those 'sounds of silence' in America then with now how citizens in other countries are reacting to the draconian "austerity" policies in Europe.
- (c) These class-war realizations have led to millions of protesters in the streets.
- (d) But in America, those in the shrinking middle class remain in a kind of social narcolepsy.

43. a The paragraph is about Reagan's decision to move backwards in terms of economic and social welfare. It is about the class warfare between the rich and the working class. The author states that Reagan's gamble paid off – the last line makes a reference to the factors that supported this gamble. The best answer would be one that concludes the passage with a reference to the gamble that was made. Option (a) does this. Option (b) is incorrect, as the scope of discussion on the country is not defined. Moreover, it begins the discussion on a new topic and should start with a new paragraph.

44. 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.

We mistakenly treated the end of the cold war as a victory that allowed us to put our feet up — when it was actually the onset of one of the greatest challenges we've ever faced. We helped to unleash two billion people just like us — in China, India and Eastern Europe. For us to effectively compete and collaborate with them — to maintain the American dream — required studying harder, investing wiser, innovating faster, upgrading our infrastructure quicker and working smarter.

- (a) Our European friends went on a similar binge.

- (b) But the real problem is that the global economy is badly over leveraged.

(c) Instead of doing that, we injected ourselves with massive amounts of credit.

- (d) This enabled millions of people to buy homes they could not afford.

44. c The paragraph is in the first person and so the last sentence should not be in the second or third person. This rules out options (b) and (d). Both the options do not deal with the theme of the passage. The last sentence also states what was required to maintain the American dream and the word 'that' in option (c) refers to it. Moreover, the paragraph has a negative tone and starts by pointing to a mistake. Thus it is logical for the last sentence too to end on a negative note. Option (c) is the correct answer. Option (a) can be ruled out because it violates the scope of the passage.

45. b As Chitta is immediately behind Farrar, Chitta must be the last person in the queue. As Bukka is immediately in front of Ganesh and Ganesh is not immediately in front of Farrar, we get two possible cases.

Case I:

Left to Right – Persons from first to last in the queue					
Bukka	Ganesh			Farrar	Chitta

Since Aadi is immediately in front of neither Bukka nor Farrar and Ganesh is not immediately in front of Aadi, this case is not possible.

Case II:

Left to Right – Persons from first to last in the queue						
Aadi	Devan/ Emaan	Bukka	Ganesh	Emaan/ Devan	Farrar	Chitta
Devaan	Emaan	Bukka	Ganesh	Emaan	Farrar	Chitta

Hence, Bukka is the third person from the front in the queue.

Directions for questions 46 to 48: The passage given below is followed by a set of three questions. Choose the most appropriate answer to each question.

Having researched the historiography of Berlin, I tried to ascertain where the gaps in knowledge were – as historians; we need those gaps to work in. It struck me that a people's history of Berlin during the war was rather lacking. Added to that realization was the feeling that there is an awful lot of first-hand material from that time that is available: published and unpublished memoirs, diaries and so on. So I became convinced that it was a rewarding avenue to pursue. It ties in also with the trend over the last couple of decades towards a 'democratization' of history; the shift from a top-down view – that of politicians and commanders – to a more popular one reflecting the experience of the man and woman in the street. Above all, I think, I wanted to challenge the lazy convention by which we see ordinary Germans at that time as a homogenized mass of Nazis, like robots, all marching in goosestep. Despite its popularity, that was never a terribly realistic assumption for any historian to make. I wanted to bring out the multiplicity of opinions and voices that were available in wartime Berlin.

The book has a great deal of original research behind it and much of the material you employ is largely unknown, at least to English language readers. It may seem remarkable to many people that there is anything left to say about Nazi Germany, but plainly there is. How did I go about finding that material? There are always new avenues opening up. There were a couple of places where I started my research for the book. One was the German Diary Archive in Emmendingen in southwestern Germany. In addition, there is a wonderful organization in Berlin that puts eyewitnesses in touch with historians, documentary filmmakers and the like. I approached them and they came back with a list of names and phone numbers. I ended up with about 40 Berliners of the wartime generation whom I then interviewed. I ended up with far more first-hand material than I could sensibly use.

I was looking first of all for patterns. The difficult thing with oral history is looking at what people remember and judging the accuracy of their recollections, the validity of it all. Historians must have their antennae tuned towards those issues. But it is the patterns, the symmetry of experience and subsequent corroboration that is important, as well as anything that stands out from those patterns. Exceptions had to be plausible; a few of my interviewees were plainly suffering from the ravages of age. But it was a fascinating experience to sit down with these people in elegant rooms in Berlin suburbs over coffee and cake and listen to their often hair-raising stories.

46. What does the author mean by 'democratization' of history?
- (a) Rewriting history on the basis of established facts and verifiable data.
 - (b) Including the opinions of the common man.
 - (c) Changing the focus from the opinion and experience of politicians to that of common people.**
 - (d) Considering multiplicity of opinions and voices available.
46. c The passage talks about shifting of the view from top (politicians and officials) to down (man and woman in the streets). Option (c) reflects this. Option (a) is irrelevant as it fails to address the issue. Option (b) is incorrect as it's incomplete in providing the idea by talking about a mere inclusion of opinions of the common man. Option (d) talks about multiplicity whereas democratization focuses mainly on common man.
47. Which of the following has not been mentioned by the author as a factor he took into account to write the book?
- (a) The availability of first hand material related to the book.
 - (b) The opportunity to challenge the common understanding about the Germans.**
 - (c) The trend towards democratization of history.
 - (d) None of the above
47. b Options (a) and (c) have been mentioned in the first paragraph and are negated. Refer to the lines "Above all, I think, I wanted to challenge the lazy convention by which we see ordinary Germans at that time as a homogenized mass of Nazis, like robots, all marching in goosestep. Despite its popularity, that was never a terribly realistic assumption for any historian to make. I wanted to bring out the multiplicity of opinions and voices that were available in wartime Berlin." The author does not try to challenge the understanding about Germans in general. He only talks about the perception about Germans during the wartime. He tries to challenge the opinion about Germans in wartime Berlin (and has specifically mentioned *that period*) and has considered it as a factor. But option (b) presents a generalization which is beyond the scope of the passage and cannot be inferred as a factor the author took into account to write the book.
48. Which of the following statements best describes the way in which the passage proceeds?
- (a) The author challenges a position popular with historians and justifies his assertions.
 - (b) The author provides a historical backdrop to Nazi Germany and explains the forces that had been at work at that time.
 - (c) The author discusses the motivations behind his book, the research that has gone into it, and elaborates on its procedures and challenges.**
 - (d) The author comments on the originality of his research and explains its relevance to his book.
48. c The author starts by talking about how, after having researched the historiography of Berlin, he identified some gaps in knowledge that he could work in. He goes on to discuss his intention of bringing out the multiplicity of opinions and voices that were present in wartime Berlin. The author then discusses the original research that has gone into the book and talks about his research procedures and challenges. Hence, option (c) is the most appropriate choice.

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

Pull

- (a) **By cheating his master and slow poisoning him, the servant thought that he has been able to pull the fast one.**
(b) She saw the ambulance coming up behind her and pulled over.
(c) They waved as the bus pulled away.
(d) The clever leader pulled strings to mitigate the chances of a deserved defeat.

49. a 'Pull a fast one' is the correct idiom and it means to trick somebody. Thus sentence (a) is incorrect.
'Pull over' (of a vehicle or its driver) means to move to the side of the road in order to stop or let something pass. Thus, sentence (b) is correct.
'Pull away' in context of a vehicle means to start moving. Thus, sentence (c) is correct.
'Pull strings' means to exert hidden influence or control. Thus, sentence (d) is correct.

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

Close

- (a) **We closed on with the invaders shortly before sundown.**
(b) Our candidate successfully closed the distance to the lead race.
(c) There is no flower close to a rose.
(d) When the newspaper story broke suggesting possible corruption in the government, the politicians all closed ranks.

50. a The sentence (a) should be 'We closed with' and not 'We closed on with'. 'Closed with' means to engage in a struggle at close quarters; grapple <close with the enemy>. Thus sentence (a) is incorrect.
'Closed the distance' means to finish or end the distance. Thus, sentence (b) is correct.
'Close to' means comparable or near in space or time. Thus, sentence (c) is correct.
If a group of people close ranks, they work closely together to defend themselves, especially when they are being criticized. Similarly, if soldiers close ranks, they move closer together in order to defend themselves. Thus, sentence (d) is correct.

Directions for questions 51 and 52: Answer the questions on the basis of the information given below.

Four friends – Arjun, Bheem, Nakul and Sahadev – have different heights and different weights. Bheem is not the heaviest and is shorter than Nakul. The only person shorter than Arjun is Sahadev. The tallest among them is the second heaviest. Arjun is neither the lightest nor the heaviest.

For questions 51 and 52:

The given information can be tabulated as shown below.

Left to Right (Increasing order of height/weight)				
Height	Sahadev	Arjun	Bheem	Nakul
Weight	Bheem	Arjun	Nakul	Sahadev

51. a Bheem
52. c Sahadev
53. There are two gaps in the sentence given below. From the pairs of words given, choose the one that fills the gaps most appropriately.

For essential to morality is that its norms apply with equal to everyone; moral relativism, it has always seemed to me, is an

- (a) effect; semiotic
(c) legitimacy; oxymoron
(b) lawfulness; illusion
(d) proportion; understatement

53. c In the given sentence, the author tries to put forward his/her opinion about morality. According to the author, it is mandatory that the norms of morality apply equally to everyone. So, the only word that can describe the author's opinion on moral relativism is 'oxymoron'. An oxymoron means a phrase that combines two words that seem to be the opposite of each other, for example a deafening silence. In context of the given sentence, 'legitimacy' and 'oxymoron' are apt words for the first and the second blank respectively.

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

Asked if they are worried about Mr. Hazare becoming a cult figure, perhaps even the image and methods of Gandhi, his supporters roared back that their leader was pure, set on a good cause to India of dreadful corruption.

(a) supplanting; warp
(c) emulating; ennable

(b) embezzling; clean
(d) usurping; purge

54. d The clue words are 'the supporters roared back'. It means that something was said against Mr. Hazare which made his supporters angry and they roared back with a positive statement. Both 'supplanting' which means to take the place of somebody/something (especially somebody/something older or less modern) and 'usurping' which means to take somebody's position and/or power without having the right to do this are appropriate for the first blank. 'Embezzling' which means to steal money that you are responsible for or that belongs to your employer is out of context of the given sentence and 'emulating' is rejected as it has a positive connotation. Thus, options (b) and (c) are negated. 'Warp' which means to cause to judge, choose, or act wrongly or abnormally; to influence somebody so that they begin to behave in an unacceptable or shocking way goes against the theme and context. 'Purge' means to make somebody/something pure, healthy or clean by getting rid of bad thoughts or feelings and matches well with the context of purging India of corruption. Hence, 'usurping' is apt for the first blank and 'purge' is apt for the second.

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

Despite his misgivings, the mayor did *deign* (A) / *doyen* (B) to speak to the crowd at the tavern. Not paying his traffic fines served to *disbar* (A) / *debar* (B) the lawyer so he could no longer practice law.

Salary will be *commensurate* (A)/ *commiserate* (B) with experience.

The captains on the old whaling fleets used a *sextant* (A) / *sexton* (B) to set the courses for their ships.

A consequence of living on the streets was the *depravation* (A) / *deprivation* (B) of character of the youth.

(a) AAAAA

(b) ABABA

(c) BABAB

(d) BBBBA

55. a AAAAA

'Deign' means to do something in a way that shows you think you are too important to do it. 'Doyen' means the most respected or most experienced member of a group or profession. So, 'deign' is correct for the first sentence. 'Disbar' means to stop a lawyer from working in the legal profession, especially because he or she has done something illegal whereas 'debar' means to officially prevent somebody from doing something, joining something, etc. So the word 'disbar' is more appropriate in the context of a lawyer. 'Commensurate' means matching something in size, importance, quality, whereas 'commiserate' means to show somebody sympathy when they are upset or disappointed about something. So 'commensurate' is the apt word for the given sentence. 'Sextant' refers to an instrument for measuring angles and distances, used to calculate the exact position of a ship or an aircraft whereas 'sexton' refers to a person whose job is to take care of a church and its surroundings, ring the church bell, etc. 'Depravation' means moral corruption whereas 'deprivation' refers to the state of not having something that you need, like enough food, money or a home. Thus, in the context of character, 'depravation' is more suitable than 'deprivation'.

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

She found an antique tea *caddie* (A) / *caddy* (B) which was used to keep tea in.

In the past, some teachers would *cane* (A) / *cain* (B) students who misbehaved.

Some of the witnesses had to run the *gauntlet* (A) / *gauntest* (B) of television cameras and reporters.

We admired the painting of the *serif* (A) / *seraph* (B) on the ceiling of the chapel.

On the transcontinental train, the *saloon* (A) / *salon* (B) car was the best place for us sit so we could see the scenery.

(a) BBABA

(b) ABBAB

(c) BAABA

(d) AABAA

56. c BAABA

'Caddie' refers to a person who helps a player by carrying his or her clubs and equipment during a game (golf). A tea caddy refers to small box with a lid that you keep tea in (tea pot). 'Cane' somebody means to hit a child with a cane as a punishment. 'Cain' refers to the brother of Abel (in the Bible); a murderer. 'Gauntlet' refers to a strong glove with a wide covering for the wrist, used for example when driving. *Run the gauntlet* means to be criticized or attacked by a lot of people, especially a group of people that you have to walk through. 'Gauntest' is the superlative form of gaunt and means very thin, usually because of illness, not having enough food, or worry. 'Serif' refers to a short line at the top or bottom of some styles of printed letters. 'Seraph' refers to an angel of the highest rank. So, 'seraph' is apt for the fourth sentence. 'Saloon' refers to a car with four doors and a boot/trunk (space at the back for carrying things) which is separated from the part where the driver and passengers sit. It also refers to a large comfortable room on a ship, used by the passengers to sit and relax in. 'Salon' on the other hand refers to a shop/store that gives customers hair or beauty treatment or that sells expensive clothes.

57. 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.

In recent years, researchers have begun talking about mental health care in the same way addiction specialists speak of recovery — the lifelong journey of self-treatment and discipline that guides substance abuse programs. The idea remains controversial: managing a severe mental illness is more complicated than simply avoiding certain behaviors.

(a) Yet people like Joe Holt are traveling it and succeeding.

(b) The journey has more mazes, fewer road signs.

(c) Now more people are risking exposure to tell their stories publicly.

(d) And traditional medicine has not worked very well for most.

57. b The paragraph discusses mental healthcare as a lifelong journey and ends by speaking about the fact that it is complicated. Option (b) puts the complicated nature of mental healthcare into perspective. Option (a) is incorrect as it brings about the success of a particular person, whereas the author refrains from giving his opinion about the idea and merely states that the idea is disputable. So option (a) does not fall in line with the opinion of the author and appears to be too abrupt. Option (c) is incorrect as it deviates from the central idea – there is no mention of the risk involved in revealing one's stories. Option (d) is also incorrect as it brings in the limits of traditional medicine, which is not within the scope of the paragraph.

Directions for questions 58 to 60: Answer the questions on the basis of the information given below.

Eight friends wearing shirts of eight different colours – Red, Blue, Green, Yellow, Pink, Black, White and Purple – are sitting at a circular table in clockwise order respectively. Their names are Ashish, Bhola, Coral, Deva, Emran, Fardeen, Gopi and Hemant, in no particular order. Each of them is either facing the center of the table or facing exactly the opposite direction away from the center. It is also known that:

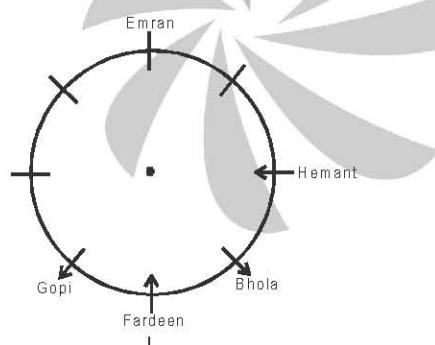
- (i) Ashish is sitting two places to the right of Emran and Emran is sitting two places to the right of Ashish. Coral and Gopi are not sitting at diametrically opposite positions.
 - (ii) Emran is sitting three places to the right of Gopi and two places to the right of Hemant.
 - (iii) Bhola is sitting immediately to the right of Fardeen and Hemant is sitting immediately to the left of Bhola.
 - (iv) The person sitting two places to the right of Bhola is facing away from the center of the table.
 - (v) Among the four pairs of friends sitting at diametrically opposite positions, there is just one pair in which the two friends are facing different directions.
58. If Coral is wearing the Yellow shirt and is facing East, then which direction is the person wearing the Red shirt facing?
(a) North-West (b) South-East (c) North (d) South
59. If Bhola is wearing the Green shirt and is facing South-West, then which direction is the person wearing the Black shirt facing?
(a) North-East (b) South-East (c) North (d) West
60. What is the angle (in degrees) between the direction which Bhola is facing and the direction which Deva is facing?
(a) 45 (b) 90 (c) 135 (d) 180

For questions 58 to 60:

Let Ashish, Bhola, Coral, Deva, Emran, Fardeen, Gopi and Hemant be represented by A, B, C, D, E, F, G and H respectively. We can start arranging by fixing the position of F using statement (iii). This gives us two possible cases.

Case I: F is facing the center.

From statement (iii), as H is sitting immediately to the left of B, B must be facing away from the center. From statement (ii), as E is sitting two places to the right of H, H must be facing the center and hence G, who is sitting three places to the left of E, must be facing away from the center. The conclusions made thus far can be shown in the figure given below.

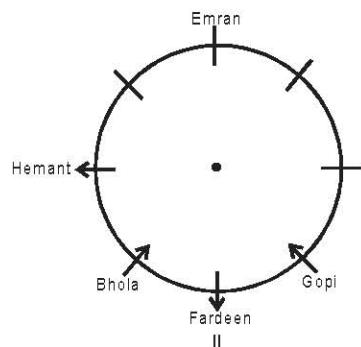


(Arrows indicate the direction in which the person is facing.)

From here we can conclude that G, who is sitting two places to the right of Bhola, is facing away from the center.

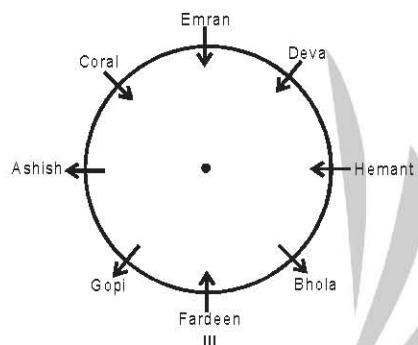
Case II: F is facing away from the center.

From statement (iii), as H is sitting immediately to the left of B, B must be facing the center. From statement (ii), as E is sitting two places to the right of H, H must be facing away from the center and hence G, who is sitting three places to the left of E, must be facing the center. In this case statement (iv) is violated. The conclusions made thus far can be shown in the figure given below:



(Arrows indicate the direction in which the person is facing.)

Further analysis (following Case I) leads to the final arrangement given below.



- 58. a North-West
- 59. c North
- 60. b 90°