

1 (d)

Let the original speed of the bus be X km/hr.

Now according to question,

$$(63/X) + \{72/(X+6)\} = 3$$

$$\text{or } 9 \left[\frac{7}{X} + \frac{8}{(X+6)} \right] = 3$$

$$\text{or } \{(7X + 42 + 8X)/X(X+6)\} = 1/3$$

$$\text{or } 45X + 126 = X^2 + 6X$$

$$\text{or } X^2 - 39X - 126 = 0$$

$$\text{or } X^2 - 42X + 3X - 126 = 0$$

$$\text{or } (X - 42)(X + 3) = 0$$

$\therefore X = 42$ km/hr. (neglecting -3, because speed can't be negative.)

2 (d)

By statements 1 and 3, it is clear that Tinku do not work in Delhi, Mumbai, Jaipur and Lucknow. Hence, we can say that Tinku works in Pune.

By statements 2 and 4, it is clear that Sintu do not work in Pune, Mumbai, Delhi and Lucknow. Hence, we can say that Sintu works in Jaipur.

Rinku	
Pinku	
Tinku	Pune
Mintu	
Sintu	Jaipur

By statement 3, it is clear that Rinku do not work in Mumbai, Jaipur and Lucknow. Hence, we can say that Rinku works in Delhi.

By statement 4, it is clear that Mintu do not work in Delhi and Lucknow. Hence, we can say that Mintu works in Mumbai.

Now only one place is left and one person is left, i.e. Pinku works in Lucknow. Hence, required arrangement is given below:

Rinku	Delhi
Pinku	Lucknow
Tinku	Pune
Mintu	Mumbai
Sintu	Jaipur

Pinku works in Lucknow. Hence option (d) is not correct.

3 (c)

By statement 1, we can conclude that $A \geq B$,

By statement 2, we can conclude that $D \geq C$,

By statement 3, we can conclude that $B > C$

On combining statements 1, 2 and 3, we get:

$$A \geq B > C \leq D$$

Hence, we can say that "A works faster than C" is definitely true.

Hence, only conclusion (c) can be drawn from the given statements.

4 (b)

We can see from the given figure that the length and breadth of the field is 12 km and 8 km respectively and length and breadth of swimming pool is 4 km and 3 km respectively.

$$\text{Now, Area of rectangular field} = \text{Length} \times \text{Breadth} = 12 \times 8 = 96 \text{ km}^2$$

$$\text{Area of swimming pool} = \text{Length} \times \text{Breadth} = 4 \times 3 = 12 \text{ km}^2$$

$$\text{Probability of asteroid falling inside the swimming pool in the rectangular field} = \frac{\text{Area of swimming pool}}{\text{area of rectangular field}} = \frac{12}{96} = \frac{1}{8}$$

Probability of asteroid falling inside the rectangular field but outside the swimming pool = $1 - (1/8) = 7/8$
{Since total probability of any event is 1}

Hence, the probability of asteroid falling outside the swimming pool but inside the rectangular field is $7/8$.

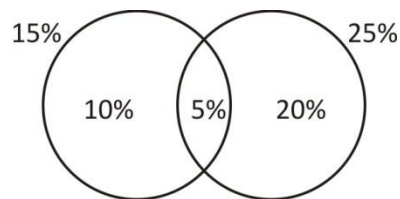
5 (c)

65% families have neither girl child nor boy child. Hence, $(100\% - 65\%)$ i.e. 35% families have either boy child or girl child or both. Hence, statement 2 is correct.

15% families have one boy child and 25% families have one girl child.

So, percentage of families having both boy and girl child = $(15 + 25) - 35 = 40 - 35 = 5\%$

It has been represented in the venn diagram given below:



From the above venn diagram, it is clear that 10% families have only boy child. Hence, statement 3 is correct.

Families that have both girl child and boy child = 1200

$\therefore 5\% = 1200$

$\therefore 100\% = 24000$

Therefore, a total of 24,000 families were surveyed. Hence, statement 1 is correct.

Therefore, all the statements 1, 2 and 3 are correct. Hence, option (c) is the correct answer.

6 (c)

Let the total length of the pencil be $100X$.

Length of portion painted in saffron colour = 60% of $100X = 60X$

Remaining part = $100X - 60X = 40X$

Length of portion painted in yellow colour = 40% of $40X = 16X$

Remaining part = $40X - 16X = 24X$

Length of portion painted in blue colour = 50% of $24X = 12X$

Remaining part = $24X - 12X = 12X$

The remaining part of the pencil ($12X$) which is 30 cm long and not coloured, is cut off.

$\therefore 12X = 30$

So, Total length of the pencil = $(30/12X) \times 100X = 250$ cm

Now, length of coloured part of the pencil after cutting the uncoloured part = $250 - 30 = 220$ cm

7 (a)

Length of scales are 40, 42 and 45 cm.

To calculate the length of cloth that can be measured by all the three scales, we have to calculate the L.C.M. of 40, 42 and 45.

Now, L.C.M. of 40, 42 and 45 = $5 \times 7 \times 9 \times 8 = 2520$ cm or 25.2 m

Hence, Anil can completely measure 25.2 m of cloth using the full length of each of the three scales.

8 (a)

Statement B is incorrect since both Marx and Weber touch upon the historical aspects of modern capitalism. It is clear from this sentence: "Marx's project is similar to Weber's in that, while he does not devote himself to the historical circumstances which have led to capitalism, he does, like Weber, attempt to understand how modern capitalism has arisen from the capitalism which preceded it."

Statement C is incorrect. It is clearly mentioned, "...capitalism manifested itself in a compulsory, socially-rooted system from which NO ONE could escape." Hence, the socially rooted system, as suggested by Weber, was mandatory and not optional in nature.

Statement D is incorrect. The passage says, "Marx's project is SIMILAR to Weber's in that, while he does not devote himself to the historical circumstances which have led to capitalism, he does, like Weber, attempt to understand how modern capitalism has arisen from the capitalism which preceded it." Hence, there are elements of similarity between their work. It does not mean there is no difference.

Statement A is correct. It is clear from the above explanations. Also, the last line of the passage says, "Thus, Marx, like Weber, contextualizes the origins of modern capitalism, delineating the historical process by which capitalism has manifested itself in its contemporary form." Thus, it can be safely concluded that both Marx and Weber concur on the historical antecedents of modern capitalism.

9 (b)

Both the statements are mutually contradictory, hence only one of them can be correct. This eliminates option C.

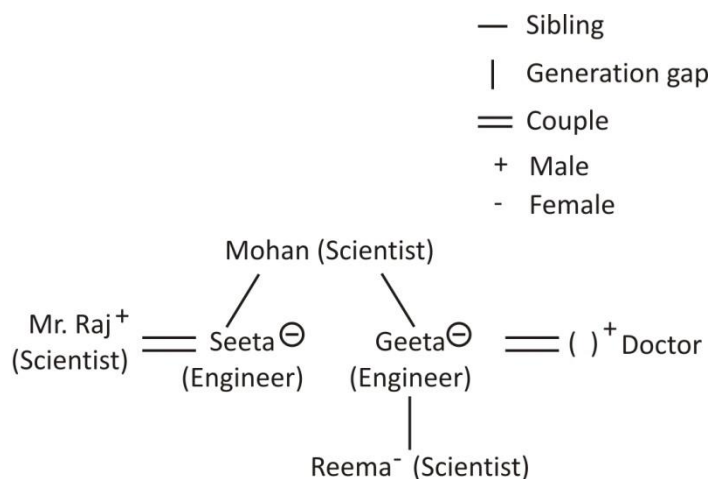
Statement 1 is an invalid assumption since the passage implies that despite making use of history, there is a difference between the works of Marx and Weber. Difference between their works: Marx does not devote himself to the historical circumstances which have led to capitalism, unlike Weber. Similarity between their works: Both attempt to understand how modern capitalism has arisen from the capitalism which preceded it.

Statement 2 is a valid assumption. The analyses of both Marx and Weber are similar in that both acknowledge the role of historical contexts in the emergence of modern capitalism. Hence, they use the same tool (historical contextualisation) to study a present day phenomenon (modern capitalism).

10 (b)

Many factors like control of effluents and dumping of construction material, removing the encroachments from the flood plains, proper monitoring of water quality etc. are needed to improve the quality of the water of a river. The impact of climate change has not been discussed in the passage. Keeping these things in the mind, the most appropriate among the given answer options is option B.

11 (c)



From the above family tree, it is clear that doctor is the brother-in-law of Seeta. Hence, option (c) is the correct answer.

12 (b)

Given that:

Mr. X spends 80% of his salary, it means he saves 20% of his salary.

Similarly, Mr. Y spends 70% of his salary, it means he saves 30% of his salary.

Now according to question,

$$(20\% \text{ of X's salary}) / (30\% \text{ of Y's salary}) = 4/3$$

$$(X's \text{ salary}) / (Y's \text{ salary}) = 2/1$$

Hence, ratio of X's salary and Y's salary is 2:1.

Now, we know that the sum of X's salary and Y's salary is Rs. 63000.

Hence,

$$\text{Mr. X's salary} = (63000/3) \times 2 = \text{Rs. } 42000$$

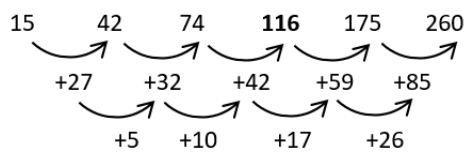
$$\text{Mr. Y's salary} = (63000/3) \times 1 = \text{Rs. } 21000$$

$$\text{Difference between Mr. X's salary and Mr. Y's salary} = \text{Rs. } 42000 - \text{Rs. } 21000 = \text{Rs. } 21000$$

Hence, option (b) is the correct answer.

13 (c)

Required sequence is-



$$5 = 2^2 + 1$$

$$10 = 3^2 + 1$$

$$17 = 4^2 + 1$$

$$26 = 5^2 + 1$$

$$X = 74 + 42 = 116$$

Hence, option (c) is the correct answer.

14 (d)

In each row, the second figure is obtained by removing the outermost element of the first figure and third figure is obtained by removing the outermost element of the second figure.

Hence, option (d) is the correct answer.

15 (a)

By statement 1:

Pawan _ _ Sandeep Ambuj

By statement 2:

Amit _ Ambuj

By statement 3:

Harshal _ Sandeep Ambuj

By statements 1 and 2:

Pawan _ Amit Sandeep Ambuj

Clearly we can see that Harshal will be placed on blank space. Here, we can say that Amit is exactly at the middle of the row.

By statements 2 and 3:

Harshal Amit Sandeep Ambuj

Clearly we can see that we cannot find the exact place of Pawan. So, we cannot say that who stands exactly at the middle of the row.

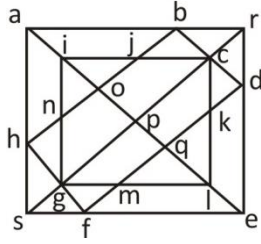
By statements 1 and 3:

Pawan Harshal _ Sandeep Ambuj

Clearly we can see that Amit will be placed on blank space. Hence, Amit is exactly at the middle of the row. But the combination of statements 1 and 3 is not given in the options.

Hence, only option (a) is correct.

16 (d)



In the given figure there are 38 triangles. These are:

Type 1: nio, ghn, hgs, fgs, gfm, mlq, kql, cdk, bcj, bcr, dcr, ijo

Type 2: apr, pre, pes, pas

Type 3: igp, icp, lcp, lgp

Type 4: icl, clg, lgi, gic

Type 5: hab, hfs, def, brd

Type 6: aho, abo, deq, feq

Type 7: nij, klm

Type 8: ase, are, asr, esr

Hence, option (d) is the correct answer.

17 (a)

Let t be the time taken by them to meet.

Distance travelled by first train = Speed \times Time = $70 \times t = 70t$

Distance travelled by second train = Speed \times Time = $85 \times t = 85t$

Now, the difference in the distances travelled by the two trains is 150 kms

Therefore, $85t - 70t = 150$

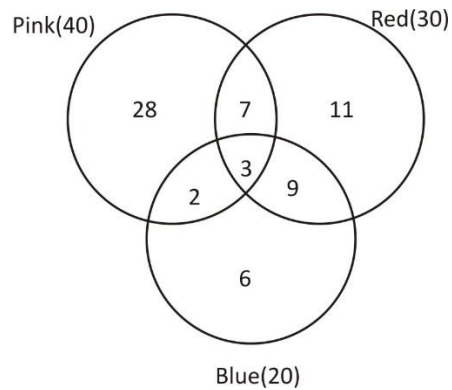
Or $15t = 150$

Or $t = 10$ hr

So, Total Distance between Mumbai and Meerut = $(85 + 70) t = 155 \times 10 = 1550$ kms

18 (c)

On depicting the given details in Venn diagram, we get:



Total superheroes = 125

Number of superheroes who wear dress of pink, red and/or blue colours = $28 + 7 + 3 + 2 + 9 + 11 + 6 = 66$

Number of superheroes who were there without any of the given colours dress, $x = 125 - 66 = 59$

Hence, x is 59 which is a prime number.

19 (d)

Let initially there were x stations.

Total tokens to be sold = $x(x - 1)$

Let after six months there were y new stations.

Total number of stations = $x + y$

Total tokens to be sold after six months = $(x + y)(x + y - 1)$

Now according to question,

$$(x + y)(x + y - 1) - x(x - 1) = 34$$

$$\text{Or } x^2 + xy - x + xy + y^2 - y - x^2 + x = 34$$

$$\text{Or } y^2 - y + 2xy = 34$$

$$\text{Or } y(y - 1 + 2x) = 34 \dots(i)$$

Now checking with options,

(a) If $x = 17$ and $y = 1$,

$$\Rightarrow 1(1 - 1 + 2 \times 17) = 34$$

$$\Rightarrow 34 = 34 \quad \{\text{satisfied}\}$$

(b) If $x = 8$ and $y = 2$,

$$2(2 - 1 + 2 \times 8) = 34$$

$$\Rightarrow 34 = 34 \quad \{\text{satisfied}\}$$

(c) If $x = 8$ and $y = 3$,

$$3(3 - 1 + 2 \times 8) = 34$$

$$\Rightarrow 54 \neq 34 \quad \{\text{not satisfied}\}$$

Hence, options (a) and (b) both can be true.

20 (a)

Option A is a correct inference. The last line of the passage implicitly indicates that right skill oriented policy making can help emerging markets like India to gain. Further, it is mentioned that new sectors would be formed (in digital space). India can gain from these emerging trends if the right policy measures are duly taken.

Option B is incorrect: It is clearly mentioned that digital technologies would reduce employment in some old, typically low and medium-skill sectors. It does not mean other sectors of economy have not been impacted at all.

Option C is incorrect: The passage only talks about reduction in employment in some old, typically low and medium-skill sectors. It would be an exaggeration to say that there would be large scale job losses.

Option D is incorrect with reference to the passage. Author points out that there is a POTENTIAL for emerging markets like India to reap benefits from digital technologies. It would be premature to say that India has already benefited.

21 (b)

Here, statement 1 is correct. The passage says that INCREASING glacial melts could destabilize the rivers by changing their stream flow. An optimum rate of glacial melt is actually needed to maintain the flow of rivers. It is the deviation from this optimum rate that raises concern.

Option 2 is incorrect as it is a fact mentioned in the paragraph. There is no need to assume it.

Option 3 is also incorrect. The passage mentions that the ultimate decrease in river flow as a result of reduced glacial melt would adversely impact agriculture. However, the reverse might not be true. The

transient increase in river flow might lead to flooding which in turn would again reduce agricultural productivity.

22 (b)

Option A is incorrect. The passage mentions that the destructive power of fire is necessary for the preservation of other ecosystems. Hence, if there is no fire, other ecosystems might be adversely affected. Therefore, frequent forest fires should be regulated, not all forest fires. Option B follows from this analysis. If all forms of forest fires are prevented, it might prevent the development of natural fauna and flora in other ecosystems. This may have disastrous consequences in the long run. Hence, option B is a logical corollary to the above passage.

Option C is incorrect. The very first line of the passage says, "In a rainforest like the Amazon, massive forest fires are a disaster." Hence, it would be incorrect to say that Amazon fires are not disastrous.

Option D is also incorrect. This answer option merely restates a fact already mentioned in the passage. It does not make any proposition which the questions demands.

23 (d)

Statement 1 is an invalid assumption. The passage clearly says that within three years of the fire nothing grows in the exhausted soil. Hence, the leftover ash does not help the forest soil address its nutrient deficiency. They might be getting washed away by rain. Though it may be true in some places, it is not a rule.

Statement 2 is also an invalid assumption. The passage quotes the case of Amazon which is a rainforest. It would be incorrect to assume that forest fires predominantly occur in rainforests like Amazon. It is probable that other types of forests witness more frequent fires.

24 (a)

The passage talks about the excavation of distillation stills from the cities of the Indus Valley Civilisation. It, then, moves on to Sanskrit texts talking about the art of perfumery. This means perfumes might have been used by Indus Valley people. Hence, it can be safely assumed that excavations tell us about the existing socio-cultural lives of historical times.

The second assumption is not correct because many ancient Indian texts also mention about the art of perfumery. The passage quotes Sanskrit texts on the art of perfumery to support this argument.

25 (b)

The passage begins by mentioning the structure of Indian population vis-a-vis its income, which has a pyramidal pattern. The terms 'big head' and 'fat belly' refer to the change in this pyramidal pattern. "Heavy belly" refers to a dramatic increase in the size of the lower middle class, and "big head" refers to rising income inequality. Option C might seem a little confusing. The passage talks about income distribution, not the number of people as a function of their ages. Hence, option C is incorrect.

26 (a)

By seeing the above given statements, we can say that:

Tanuj and Waqar must be speaking the truth. So, Tanuj cannot be the person responsible for leaking the question paper.

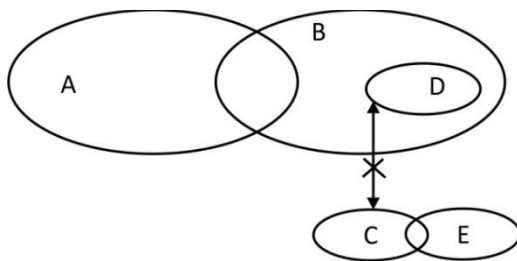
Now, one of Pawan, Upendra, Vikas must be speaking the truth and two of them must be lying.

On checking we can see that either Pawan or Vikas must be speaking the truth. If Pawan is speaking the truth then our culprit is Vikas and if Vikas is speaking the truth then our culprit is Waqar.

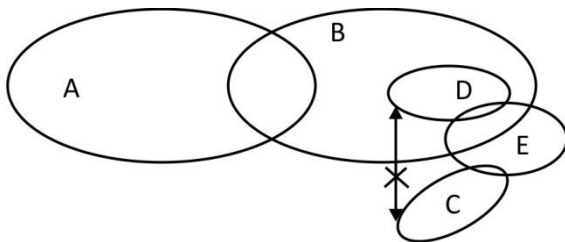
So, either Waqar or Vikas is responsible for leaking the question paper.

27 (b)

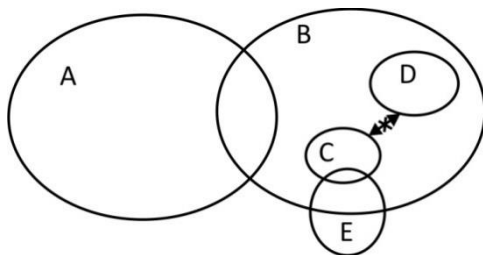
Case 1-



Case 2-



Case 3-



By looking at the diagrams in case 1, case 2 and case 3, we can say that both conclusions I and IV are individually **not** true. But, conclusions I and IV makes a contradictory pair. One of them is bound to be true.

Some B are C is a possibility. Therefore, conclusion III is true.

Hence, either conclusion (I or IV) and conclusion III are true.

28 (a)

Let the correct code be ABC.

From point (iv), we can say that, none of 7, 3 and 9 can be any of A, B, and C.

From point (v), we can say that 0 can be one of A, B and C.

From point (i) and (ii), we can say that,

2 and 5 are one of A, B and C and $C = 2$.

So, the required digits are 0, 2 and 5, where $C = 2$.

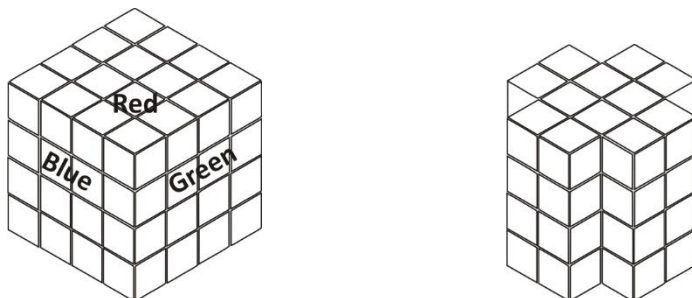
From point (iii), B cannot be equal to 0. So, $A = 0$, $B = 5$ and $C = 2$.

Hence, the required correct code, $ABC = 052$.

Hence, option (a) is correct.

29 (a)

In the figure given below, we can see cubes before and after four vertical edges are removed.

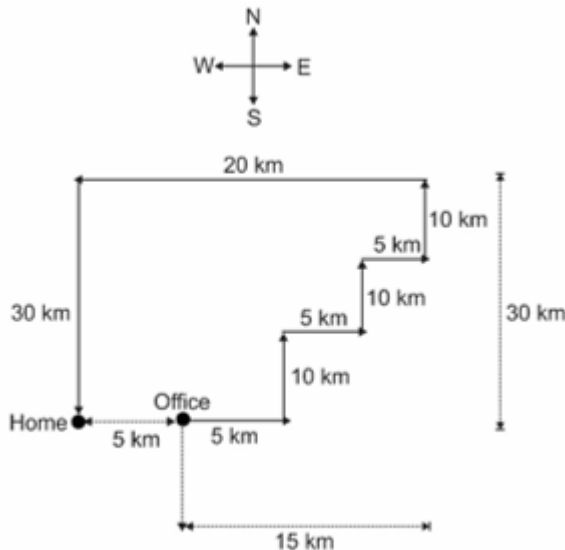


On the top face, there are eight cubes which have two different coloured faces. Similarly, on the bottom face, there are eight cubes which have two different coloured faces.

Hence, total cubes which have two different coloured faces = $8 + 8 = 16$

30 (d)

On drawing the figure according to the question,



Required distance = **5 km**

Direction of his home from office = **West**

Hence, his home is 5 km away in the west direction from his office.

31 (c)

The third line (...that seeking such a punishment “would be a regressive step in the field of sentencing and reformation”) of the paragraph clearly indicates that punishment should not be for retribution but to reform the convict. Thus the first assumption is correct.

It is evident from the paragraph that the government went against the recommendations of Verma Committee, and awarded death penalty to the convicts. One of the underlying assumptions behind this move is that awarding strict punishments like death penalty would act as a deterrent to such heinous crimes. Hence, statement 2 is also correct. Though the passage states that, “It is a fact that sexual crimes against women have not come down since the Delhi case.” But it is a fact and not an assumption. The assumption being made is that crime rates should go down if stringent punishments are meted out.

32 (c)

Option A is not a correct inference. The passage says they are **USUALLY** made of wool these days. From this it would be incorrect to infer that cotton is not used at all.

Option B is also incorrect. The passage clearly says that the name Dhurrie comes from the Indian word dari. It is highly likely that the practice was born in India. At the same time, it is incorrect to conclusively say that the practice did not start in India.

Option C is correct. First sentence of the passage says that Dhurrie rugs are hand woven in India. And, the last sentence says, "The rugs are noted for their soft colours, their varieties of design, and they make a stunning focal point for any living room or dining room." Therefore, it can be safely inferred that hand woven products can also have varieties in design, and can attract the attention of visitors.

Option D is incorrect. The passage makes no mention about imports from China. Hence, this statement is beyond the scope of this passage.

33 (d)

Option A: The passage clearly mentions that politicians, policy makers and markets looked on while the early window for social distancing closed. This suggests that there was a delay in enforcing social distancing measures. Hence, it would be incorrect to conclude that there is NO clarity on this.

Option B: There is no comparative analysis of countries in terms of the number of fatalities vis-à-vis implementation of social distancing norms. Hence, this statement is beyond the scope of this passage.

Option C: The passage suggests that countries that did not take social distancing measures seriously were guided by historical patterns of disease outbreaks. Hence, historical patterns were not effective in guiding the policy measures of affected countries.

Option D: The passage implies that timely application of social distancing measures could have saved up on some economic costs and its absence has only added to the confusion regarding the same. It also impacted future projections as is clear from this sentence, "...predicting the path ahead has become nearly impossible, as multiple dimensions of the crisis are unprecedented and unknowable."

From the above analysis, option D is the most logical and appropriate conclusion.

34 (b)

The passage implies uncertainty regarding the structural impact of coronavirus on the world economy. It is evident from the last two lines of the passage: "...whether economies will be able to return to their pre-shock output levels and growth rates, and whether there will be any structural legacy..." Hence, statement 1 cannot be ascertained with certainty, making it an invalid assumption.

The passage implies that informed by previous patterns of disease outbreaks, some countries looked past social distancing measures initially. Missing that window has exacerbated the economic cost of the pandemic. Hence, statement 2 can be thought of as a valid assumption.

35 (a)

Assumption 1 is correct. It is evident from the first line of the passage which says, “A watershed moment for women’s participation in revolt and resistance was the Swadeshi movement in the early 1900s.” A watershed moment is a turning point, the exact moment that changes the direction of an activity or situation (in this case women’s participation in mass movements).

The second assumption is not correct. The passage clearly says, “It was made possible because the movement did not contest women’s ‘femininity’...” Hence, it would be incorrect to assume that participation of women in outdoor activities like protests and picketing affects their ‘femininity.’

36 (b)

The line ‘Sun would “go silent” and not give out sunspots for an extended period’ gives the meaning of the term “go silent”. Further, it is mentioned that huge solar flares and coronal mass ejections spew material from the Sun’s surface into outer space. Therefore, if the Sun goes silent these ejections from the solar surface would stop. Option B best captures this meaning.

37 (a)

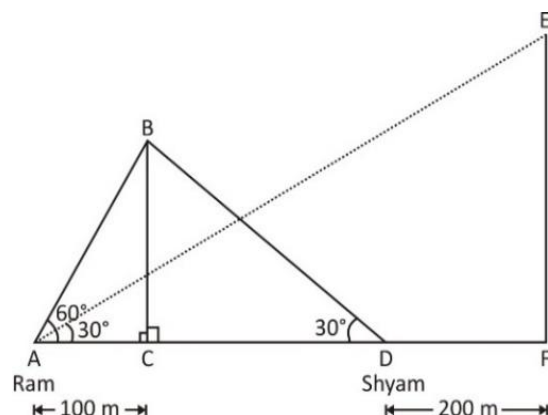
The passage mentions that sunspots are relatively cooler areas on the surface of the sun. Therefore, it is obvious that the surface temperature is not uniform. Hence, the first assumption is correct.

The second assumption is wrong as sunspots have been followed by solar observers for the past hundreds of years. So far, astronomers have documented 24 such cycles, the last one ended in 2019.

38 (c)

Let the height of pillar be BC and the height of falcon when it was shot down be EF.

Now drawing the figure according to question, we get:



In triangle ABC,

$$\tan 60^\circ = BC/AC$$

$$\Rightarrow \sqrt{3} = BC/100$$

$$\Rightarrow BC = 100\sqrt{3} \text{ metres}$$

In triangle DCB,

$$\tan 30^\circ = BC/CD$$

$$\Rightarrow 1/(\sqrt{3}) = 100\sqrt{3}/CD$$

$$\Rightarrow CD = 300 \text{ metres}$$

Now, Distance AF = 100 + 300 + 200 = 600 metres

In triangle AFE,

$$\tan 30^\circ = EF/AF$$

$$\Rightarrow 1/(\sqrt{3}) = EF/600$$

$$\Rightarrow EF = 600/\sqrt{3} = 200\sqrt{3} \text{ metres}$$

Hence, the falcon was flying $200\sqrt{3}$ metres away from ground when it was shot down.

Hence, option (c) is the correct answer.

39 (b)

English alphabet series: -

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Now writing the English alphabet series according to the question-

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
1	4	9	16	25	36	49	64	81	100	121	144	169	196	225	256	289	324	361	400	441	484	529	576	625	676

So the word "MOTION" will be written as 169 225 400 81 225 196.

Hence, option (b) is the correct answer.

40 (a)

Triples of natural numbers that satisfy the given condition are:

1, 1, 5 - these can be arranged in 3 ways.

1, 2, 4 - these can be arranged in 6 ways.

2, 2, 3 - these can be arranged in 3 ways.

3, 3, 1 - these can be arranged in 3 ways.

Hence, 15 triplets ($6 + 3 + 3 + 3 = 15$) can satisfy the given condition.
Hence, option (a) is the correct answer.

41 (a)

Given that: $64 \div 8 - 2 \times 6 \div 3 + 5 + 1 \times 7$

Writing the given equation as per the given conditions, we get:

$$64 \div 8 + 2 \times 6 \div 3 - 5 - 1 \times 7$$

Applying the BODMAS rule we get:

$$8 + 4 - 5 - 7 = 0$$

42 (b)

Given that: $3P8 + 5Q7 + 2R9 = 1104$

$$\Rightarrow (3 \times 100 + P \times 10 + 8) + (5 \times 100 + Q \times 10 + 7) + (2 \times 100 + R \times 10 + 9) = 1104$$

$$\Rightarrow 300 + (P \times 10) + 8 + 500 + (Q \times 10) + 7 + 200 + (R \times 10) + 9 = 1104$$

$$\Rightarrow 1000 + (P + Q + R) \times 10 + (8 + 7 + 9) = 1104$$

$$\Rightarrow (P + Q + R) \times 10 + 24 = 1104 - 1000 = 104$$

$$\Rightarrow (P + Q + R) \times 10 = 104 - 24 = 80$$

$$\Rightarrow (P + Q + R) = 8$$

For maximum value of Q, P and R should be 0.

If P and R is 0, then the value of Q will be 8 and it is maximum possible.

Hence, option (b) is the correct answer.

Explanation for questions 43 to 46:

Since, B is elder than two persons and C is the 3rd eldest.

- > - > C > B > - > -

A is younger than F and elder to E.

$$F > A > E$$

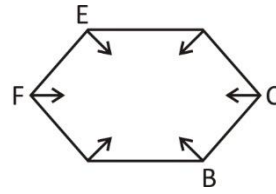
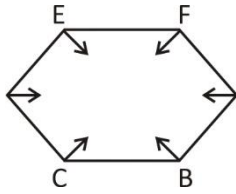
The eldest and the youngest member are not sitting near to each other and neither of them is F. So the arrangement as per the age will be:

D > F > C > B > A > E

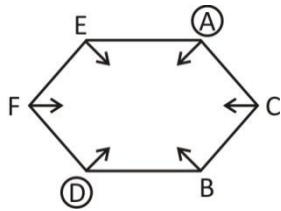
Now, around the Hexagonal table, two people are sitting between B and E (the youngest person). F is sitting opposite to C, who is the neighbour of B. So, C will be either to the immediate left of B or to the immediate right of B. Two cases are possible:

Case 1:

Case 2:



As F is sitting to the immediate left of D (the eldest person). So, case 1 will be eliminated and final sitting arrangement will be:



43 (a)

D is the eldest member.

44 (d)

In the hexagonal table, A is the neighbour of the youngest member.

45 (d)

If the age of second eldest member, i.e. F, is 51 years, then possible age of C will be either 34 years or 50 years.

46 (d)

B is fourth to the right with respect to A in anticlockwise direction.

47 (d)

L.C.M. of 3, 4, 5 and 6 = 60

Hence, the number of toffees will be $(60X+1)$. The number of toffees must be divisible by 7, because when he put 7 toffees in each pouch then there was no toffee left.

Now, $(60X + 1) = 56X + 4X + 1$

Since, $56X$ is divisible by 7, $(4X+1)$ must also be divisible by 7. It's possible only if $X = 5$.

Hence, total number of toffees = $60 \times 5 + 1 = 301$

Hence, option (d) is the correct answer.

Alternate Method:

Solving by options,

As we know that, when he put 7 toffees in each pouch, then no toffee is left. So, we can say that the number of toffees must be divisible by 7.

From options, only 301 is completely divisible by 7. Hence, total number of toffees = 301

48 (d)

Option A is wrong as #MeToo movement may have changed the attitude - now the wrongdoings have greater chance of being exposed. The passage also mentions about male employees being fired based on the allegations made by their female colleagues. Hence, the movement is a step in the direction of improving the conditions of workplace.

Option B is incorrect. It would be an exaggeration to say that sexual harassment at workplace would cease to exist after the #MeToo movement. Yes, there probably would be reduction in such cases after widespread exposure by females around the globe.

Option C can be correct. The silence on the part of victims of sexual harassment might have presented workplace in a positive light. The exposure by victims might change this perception of the workplace. However, the passage does not talk about the general perception of workplace in pre-#MeToo world. It is probable that the workplaces were infamous for some other reasons. Let's put this option on hold.

Option D can also be correct. #MeToo movement encouraged many women to come forward and narrate their ordeal. This will give a moral boost to other sections of victims who might have faced ordeal or harassment of some other kind. Hence, this answer option sounds more appropriate.

49 (d)

Statement 1 can be a corollary to the given passage. It is not an assumption.

Statement 2 is also incorrect. What goes on in the minds of the accused is beyond the scope of this passage. The passage restricts its domain to brief elaboration (with historical context) of #MeToo movement, and its consequences.

50 (b)

Option A is incorrect. The passage focussed on supply side aspect of population rise – ensuring food security even in the times of rapid population rise. Population control measures is a demand side aspect which is beyond the scope of this passage.

Option B is correct: The passage cites an IPCC report which says that a shift towards a more plant-based diet is considered a healthy and sustainable dietary option. Hence, this shift in dietary habit can help in combating climate change.

Option C is incorrect. It is mentioned that plant-based diet is a healthy and sustainable dietary option. There is also a need to augment food supplies per unit availability of water. However, it would be incorrect to infer that conservation of water resources can offset the need to shift to plant-based diets.

Option D is Incorrect: The passage recommends a MORE plant-based diet and low meat diets. It would be an exaggeration to say that ONLY plant-based diets should be consumed to prevent climate change.

51 (c)

Statement 1 is correct: The passage delineates low meat consumption and more plant-based diets to prevent climate change. It means that the author has assumed that a high animal-based diet results in an increase in release of greenhouse gases in the environment.

Statement 2 is also correct. The author is serious about the challenges posed by climate change. She cites IPCC report on sustainable dietary habits and UN study on the climatic impact of rapid population increase. Hence, it can be safely assumed that the threat of climate change is real.

52 (c)

Let the number of students in Mathematics and Biology be X and Y respectively.

Now according to question,

$$X - 10 = Y + 10$$

$$\Rightarrow X = Y + 20 \quad \dots (i)$$

$$\text{And, } X + 20 = 2(Y - 20)$$

Putting the value of X, from equation (i), in this equation, we get:

$$\Rightarrow Y + 20 + 20 = 2Y - 40$$

$$\Rightarrow Y + 40 = 2Y - 40$$

$$\Rightarrow 2Y - Y = 40 + 40$$

$$\Rightarrow Y = 80$$

$$\text{Now, } X = Y + 20 = 80 + 20 = 100$$

The number of students in Mathematics and Biology are 100 and 80 respectively.

Hence, option (c) is the correct answer.

Alternate Method:

Solving by options,

On taking option (c),

The number of students in Mathematics = 100

The number of students in Biology = 80

If 10 students left Mathematics and join Biology, then the number of students in both streams is 90 and 90 respectively. Hence, number of students in both streams is same.

If 20 students left Biology and join Mathematics, then the number of students in these streams is 120 and 60 respectively. Hence, number of students in Mathematics becomes twice the number of students in Biology.

Therefore, our assumption is true. Hence, option (c) is the correct answer.

53 (d)

Original amount (in 1995) = Rs.25,000

It is given that, his total amount doubles in every 10 years.

Amount after 10 years (in 2005) = $2 \times \text{Rs.}25,000 = \text{Rs.}50,000$

Amount at the end of 2005 = $\text{Rs.}50,000 - \text{Rs.}500 = \text{Rs.}49,500$

Amount after 10 years (in 2015) = $2 \times \text{Rs.}49,500 = \text{Rs.}99,000$

Amount at the end of 2015 = $\text{Rs.}99,000 - \text{Rs.}500 = \text{Rs.}98,500$

Amount after 10 years (in 2025) = $2 \times \text{Rs.}98,500 = \text{Rs.}197,000$

Amount after 10 years (in 2035) = $2 \times \text{Rs.}197,000 = \text{Rs.}394,000$

Therefore, he will get Rs. 394,000 at the end of the year 2035. Hence, option (d), i.e. none of these is correct.

54 (a)

Let he spent a total of Rs. $100X$ on buying 12 avocados, 18 kiwis and 5 apples. Let the price of one avocado, one kiwi and one apple be A, B and C respectively.

Now, according to question,

$$12A + 18B + 5C = 100X \quad \dots (i)$$

$$\text{And } 6A + 9B + 4C = 60X \quad \dots (ii)$$

Equation (ii) $\times 2$ - Equation (i):

On solving, we get,

$$C = 20X/3$$

$$\text{Hence, amount spent on 5 apples} = 5C = 5 \times (20X/3) = 100X/3$$

$$\text{Now, required percentage} = \{(100X/3)/100X\} \times 100 = 33.33\%$$

Hence, option (a) is the correct answer.

55 (d)

$$\text{Total runs scored by Rohit Sharma in 20 matches} = 2 \times 100 + 3 \times 0 + 4 \times 50 + 11 \times 40 = 840 \text{ runs}$$

$$\text{Average runs scored by Rohit Sharma in 20 matches} = 840/20 = 42 \text{ runs}$$

Hence, option (d) is the correct answer.

56 (b)

Let the least number be X.

Now, according to the question,

$$18 \times 15 = X + 17 \times (15 + 0.5)$$

$$\Rightarrow 270 = X + 263.5$$

$$\Rightarrow X = 270 - 263.5 = 6.5$$

Hence, the least number was 6.5.

Hence, option (b) is the correct answer.

57 (a)

Let the actual fee be Rs.100X.

$$\text{Amount asked by Rohan from his mother} = 130\% \text{ of } 100X = 130X$$

$$\text{Amount asked by Rohan's mother from Rohan's father} = 120\% \text{ of } 130X = 156X$$

$$\text{Amount given by Rohan's father to Rohan's mother} = 90\% \text{ of } 156X = 140.4X$$

According to the question,

$$140.4X = \text{Rs.}280.8$$

$$\text{Or } X = 2$$

$$\text{Hence, actual fee} = 100X = 100 \times 2 = \text{Rs. } 200$$

Hence, option (a) is the correct answer.

58 (b)

Let the cost price of the article for Amar be Rs. X.

Now, according to the question,

$$2 \times (\text{Rs.}520 - X) = 3 \times (X - \text{Rs.}320)$$

$$\Rightarrow 1040 - 2X = 3X - 960$$

$$\Rightarrow 3X + 2X = 960 + 1040$$

$$\Rightarrow 5X = 2000$$

$$\Rightarrow X = \text{Rs. } 400$$

Therefore, cost price of the article for Amar is Rs. 400.

Hence, option (b) is the correct answer.

59 (d)

Option A is incorrect because the author is not talking about how the two opinions evolved. Also, the author is not comparing hypotheses; she is merely discussing different facets of the evolution of birds in an objective manner. Option B is also incorrect because the passage doesn't SUGGEST anything.

Option C is close. The passage cites multiple examples to suggest that in many cases the findings from a fossil record are valid only till the discovery of another fossil. However, evaluating the relevance of fossil evidence is not the PURPOSE of this passage. Fossil evidence is quoted to lend support to the arguments put forth in the passage. The main purpose of the passage can be found by analysing the nature of these arguments.

Option D is the most appropriate. Phrases like "uncovering bones that evidently belong to non-avian maniraptors dating to the time of Archaeopteryx..." and "This objection was reasonable when only early theropod clavicles had been discovered, but fossilized theropod clavicles that look just like the wishbone of Archaeopteryx have now been unearthed..." suggest how there is a healthy 'debate' going on in the passage. Each side supports its arguments through empirical evidence (fossil records in many cases). Option D effectively captures the purpose of this passage.

60 (b)

Statement 1 is incorrect because this view is held by scientists, after the discovery of fossilised theropod clavicles, to counter the contention of the scientists who are unconvinced. In fact, the skeptics believed rather the opposite to be true in the absence of any evidence pointing to the contrary.

Statement 2 is right because it is simply a reiteration of the statement in the passage “Skeptics also argue that the fused clavicles (the “wishbone”) of birds differ from the unfused clavicles of theropods.” This was in fact the assumption of the scientists who were unconvinced that birds evolved from theropod dinosaurs.

61 (d)

It CANNOT be clearly stated from the passage that the route of the infection to South Korea was from China DIRECTLY. It makes the first assumption wrong. The second assumption is also wrong because the passage does not give an impression that the members of the Daegu church were involved in activities against the government. Only surety is that members preferred not to disclose their affiliation to the church. Not disclosing their affiliation to church does not amount to anti-government activity.

Hence, both assumptions are invalid.

62 (c)

Assumption is an unstated or hidden fact which supports the conclusion or arguments made in the passage.

Statement 1 is a valid assumption. First line of the passage says, “An ecosystem is a group of animals and plants living in a specific region and interacting with one another and with their physical environment.” Thus, this statement inherently means that an ecosystem is a community within which biotic and abiotic components interact among themselves.

Statement 2 is also valid. Coevolution is defined as the process of reciprocal evolutionary change that occurs between pairs of species or among groups of species as they interact with one another. And, the passage says “Ecosystems also can be thought of as the interactions among all organisms in a given habitat and may result in ADAPTATIONS for mutual benefit; for instance, relationship of flowering plants and associated pollinators.” Thus, it can be safely assumed that coevolution occurs in a mutually dependent manner as is evident from the example cited in the above sentence.

63 (c)

Message of a passage implies the intent of the author behind the passage. It gives a sense of the motive of the author behind writing the passage.

Option A is incorrect. It is only reflecting the definition of an ecosystem evident from the first line of the passage: “An ecosystem is a group of animals and plants living in a specific region and interacting with

one another and with their physical environment". It does not cover the broader message being conveyed by the passage.

Option B is also incorrect. This statement may seem to capture the harsh reality given the widespread ecological damage done by anthropogenic factors. However, it is not the message which the author intends to convey through this passage.

Statement C is correct. It most nearly encapsulates the intent of the passage. Last line of the passage says, "An important part of ecosystem management involves finding ways to protect and enhance economic and social well-being while protecting local ecosystems." Hence, there should be harmony among different components of the ecosystem.

Statement D is incorrect. The passage intends to say that the overall well-being of human life lies in the sustainability of the ecosystem as a whole. However, it would be an exaggeration to say that human life cannot be IMAGINED if the demands of ecosystem are ignored. Life may still exist albeit in an unsustainable manner.

64 (d)

Ajatshatru can do $\frac{1}{2}$ of a work in 8 days, it means he can do the whole work in (2×8) i.e. 16 days.

Bimbisar can do 25% of the same work in 5 days, it means he can do the whole work in (4×5) i.e. 20 days.

Kalashok can do $\frac{1}{4}$ of the same work in 4 days, it means he can do the whole work in (4×4) i.e. 16 days.

Shishunag can do the same work in 12 days.

Here, we can see that Ajatshatru and Kalashok will complete the work in same time and Shishunag completes the work the fastest and Kalashok works faster than Bimbisar.

Hence, statements 2, 3 and 4 are correct. Hence option (d) is correct.

65 (a)

Relative speed = $90 + 70 = 160$ km/hr

Now, Distance = Relative speed \times time = $160 \times 5 = 800$ km

66 (d)

Between 1951 and 1971, both the EAG and non-EAG States & Union Territories have grown resulting in an increase in the overall population of India. During this phase, the growth rate for the non-EAG States & Union Territories was more than that of the EAG States. **So, statement 1 is correct.**

During 1991-2001, the growth rate for the EAG States **remained almost same** as that in the previous decade, whereas there was continuous reduction (**23 -19 = 4**) in the growth rate of non-EAG States & Union Territories. This was primarily responsible to bring about a significant fall of about **2 percent (24 - 22 = 2)** in the growth rate of the country as a whole. **So, statement 2 is also correct.**

During 2001-2011, for the first time, the growth momentum for the EAG States has given a clear signal of slowing down, falling by about $25.6 - 21$ i.e. 4.6 percentage points. Though, during 1991-2001, EAG States growth rate declined but it was not sharp and hence not very clear. **So, statement 3 is also correct.**

67 (a)

Time taken by Rahul to complete the race = 30 seconds

Time taken by Kunal to complete the race = $30 + 10 = 40$ seconds

Let the distance be 1200 m

\therefore Speed of Rahul = $1200/30 = 40$ m/s

And Speed of Kunal = $1200/40 = 30$ m/s

Relative speed of Rahul and Kunal = $40 - 30 = 10$ m/s

When Rahul gives Kunal a start of 5 seconds, then distance covered by Kunal in 5 seconds = $5 \times 30 = 150$ metres

Time taken by Rahul to beat Kunal = Distance covered by Kunal in 5 seconds/Relative speed of Rahul and Kunal = $150/10 = 15$ seconds

Hence, option (a) is the correct answer.

68 (b)

Let the age of Dashrath's son be X years and age of Dashrath be 11X years in 2005.

According to question,

$$11X + 15 = 14X$$

$$\Rightarrow 3X = 15$$

$$\therefore X = 5 \text{ years}$$

Hence, age of son = 5 years

$$\text{Dashrath's age} = 11X = 5 \times 11 = 55 \text{ years}$$

$$\text{Difference between the ages of Dashrath and his son in 2005} = 55 - 5 = 50 \text{ years}$$

Hence, option (b) is the correct answer.

69 (c)

Let the selling price fixed by Chandra be Rs. X and the number of dresses sold each month be D.

We know that, Chandra sold dresses at fixed price for 8 months and offered a discount of 50% for the subsequent 4 months.

$$\text{Cost price} = 12D \times \text{Rs. } 200 = \text{Rs. } 2400D$$

$$\text{Selling price} = 8XD + 4 (0.5X) D = \text{Rs. } 10XD$$

Now, we know that she makes a net 20% profit.

$$\text{Profit\%} = \{(\text{S.P.} - \text{C. P.})/\text{C. P.}\} \times 100$$

$$\Rightarrow 20 = \{(10XD - 2400D)/2400D\} \times 100$$

$$\Rightarrow 48000D = 1000XD - 240000D$$

$$\Rightarrow 288000D = 1000XD$$

$$\Rightarrow X = 288000/1000 = \text{Rs. } 288$$

Hence, selling price fixed by Chandra is Rs. 288.

70 (b)

Let the initial quantities of petrol and diesel in the vessel be 13x litres and 5x litres respectively.

$$\text{Quantity of petrol taken out} = (13/18) \times 72 = 52 \text{ litres}$$

$$\text{Quantity of diesel taken out} = 72 - 52 = 20 \text{ litres}$$

According to question,

$$(13x - 52)/(5x - 20 + 51) = 8/7$$

$$\Rightarrow 91x - 364 = 40x + 248$$

$$\Rightarrow 51x = 612$$

$$\Rightarrow x = 12$$

So, the initial quantity of diesel in the vessel = 12x = 12 × 5 = 60 litres

Hence, option (b) is the correct answer.

71 (b)

Option A is incorrect because the gene being specific to one species alone is not a criterion mentioned in the passage. The passage may be open to the same gene being found in different species.

Option B is correct because the passage infers that if this were the only effect, the ethologists would most likely not consider the gene a behavioural gene. It is clear from the sentence: "They insist that mutations in a behavioural gene must alter a specific normal behaviour and not merely make the organism ill."

Option C is incorrect because the ethologists do not seem to be influenced by any other group including neuroscientists. This makes option D incorrect too.

72 (b)

Option A is incorrect because it is an extreme statement that refutes logic. Also, it is thoroughly countered in the passage wherein the author presents the viewpoints of two different groups of researchers on a scientific question (how genes control animal behaviour).

Option B is correct because the passage directly discusses different perspectives on a scientific question. In this case, the differing perspectives are of the neuroscientists and the ethologists on the issue of how genes control animal behaviour.

Option C is incorrect because the author does not pass any value judgement on the relevance of different perspectives on a scientific question. It only mentions the two perspectives in an objective manner. Similarly, option D is also incorrect. The author does not intend a reconciliation between the two perspectives on how genes control animal behaviour. She merely cites them to underline the uncertainties that the researchers working on this issue had to face.

73 (c)

Option A is an incorrect inference. It would be incorrect to infer that mindless consumption driven climate change is limited to middle and high income countries only. The passage quotes low income countries not in the context of climate change, but with reference to the need for economic growth in these countries.

Option B is also incorrect. The passage only talks about the adverse climatic impacts of reckless economic growth. It does not forecast economic slowdown, recession and job losses.

Option C is correct. It is clearly mentioned that India does need some growth as income levels here are still very low. This means economic growth at macro level can help raise income levels across the spectrum. Hence, it can be safely inferred that economic growth has trickle down effects.

Option D is incorrect. First, the passage does not talk about economic recession. Secondly, whether or not low income levels help shield an economy from the adverse impacts of recession is beyond the scope of this passage.

74 (c)

Inference is a conclusion drawn from the facts, data and arguments made in the passage. In other words, it is the ability of the reader to read in between the lines.

Option (a) is an incorrect inference. The passage nowhere says that internet is used by people who appreciate its power and potential.

Option (b) is incorrect. It is mentioned in the passage, "Internet, like any other technology, has a dark side. It has given rise to many human concerns that can potentially threaten our well-being". Hence, there is a significant opportunity cost of internet usage.

Option (c) is the correct inference. The passage says, "Internet has become a LIFELINE of the modern world." It is also mentioned, "But the fact remains that the internet has become INDISPENSABLE and it is here to stay with us". Hence, it can be safely inferred that It is difficult to imagine a life without internet and internet-based applications.

Option (d) is incorrect. It is evident from sentences like "...we are doing it at the cost of natural human interactions which are spontaneous and more meaningful." Author has clearly outlined the issues with digital communication. Hence, it cannot be a sustainable alternative to real life personal communication.

75 (d)

Statement 1 is an incorrect assumption. The passage only says that the youth are spending more and more time in front of screens. From this it cannot be assumed that those youths who are not having access to the internet are leading a MORE productive life.

Statement 2 is also incorrect. The passage only says that widespread internet use has other issues associated with it like proliferation of fake news and child abuse. It does not mean these issues did not exist at all in the pre-internet era.

76 (c)

This graph clearly brings out the fact that overall sex ratio increased (930 to 934) from 1971 to 1981 but it fell to 927 in 1991 and there has been a consistent rise in overall sex ratio from 1991 to 2011 (927 in 1991 to 933 in 2001 and 940 in 2011). So, after 1971 overall sex ratio of a country is not consistently rising or falling. **So, options (a) and (b) are not correct.**

The fall in child sex ratio has been unabated since 1961. So, **option (c) is correct.**

We can nowhere see a rise in child sex ratio in the graph. The graph represents consistent fall in child sex ratio since 1961. **Therefore, option (d) is incorrect.**

Hence, option (c) is the correct answer.

77 (b)

In between 1991 and 2011, the two curves of the graph intersect at the same point. So, at that particular point of time, child sex ratio (0-6 years) and overall sex ratio of a country are equal. **Therefore, statement 1 is incorrect.**

It is given that 1961 is base year. So,

Percentage change in overall sex ratio in the given 50 years (1961 to 2011) = $\{(941-940)/941\} \times 100 = 0.10\%$

Percentage change in child sex ratio (0-6 years) in the given 50 years (1961 to 2011) = $\{(976-914)/914\} \times 100 = 6.78\%$

The percentage change in child sex ratio (0-6 years) is more than that of overall sex ratio in the given 50 years.

So, statement 2 is incorrect.

The overall sex ratio in 1991 is 927 and child sex ratio in 2001 is 927.

Therefore, the overall sex ratio in 1991 and child sex ratio in 2001 are equal.

So, statement 3 is correct.

Average of child sex ratio (0-6 years) and overall sex ratio in the year 1971 = $(964+930)/2 = 947$

Average of child sex ratio (0-6 years) and overall sex ratio in the year 1981 = $(962+934)/2 = 948$

The average of child sex ratio (0-6 years) and overall sex ratio in the year 1971 and 1981 is not the same.

So, statement 4 is incorrect.

Therefore, answer is option (b).

78 (d)

Perimeter of circular track = $\pi \times d = (22/7) \times 1400 = 4400$ metres

Perimeter of square track = $4 \times \text{side} = 4 \times 1400 = 5600$ meters

We know that, speed of Milkha is same in covering circular track and square track. Let Milkha completes one round of the square track in t seconds.

So, $(4400/11) = (5600)/t$

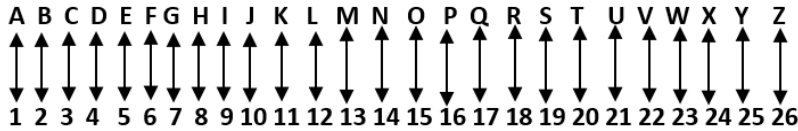
$\Rightarrow (44/11) = 56/t$

$\Rightarrow t = (56 \times 11)/44$

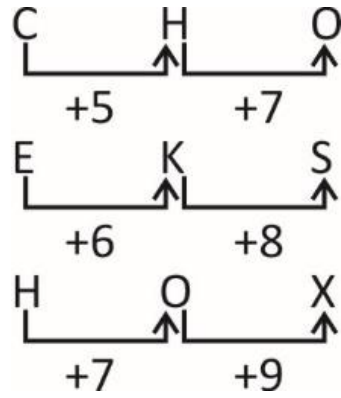
$t = 14$ seconds

79 (c)

The place value of English alphabet series is: -



Now, considering the given series,



Hence, option (c) is correct.

80 (b)

It is given that, points B, C, D and E are junctions in the network, and at every junction there will be 5 minutes waiting time.

Time taken to reach point Z from point A (considering waiting time as well) is:

- (i) $A - D - Z = 9 + 5 + 5$ (waiting time) = 19 minutes
- (ii) $A - B - C - Z = 2 + 3 + 3 + 5$ (waiting time) + 5 (waiting time) = 18 minutes
- (iii) $A - E - Z = 7 + 6 + 5$ (waiting time) = 18 minutes
- (iv) $A - B - D - Z = 2 + 2 + 5 + 5$ (waiting time) + 5 (waiting time) = 19 minutes
- (v) $A - E - C - Z = 7 + 1 + 3 + 5$ (waiting time) + 5 (waiting time) = 21 minutes

Hence, the minimum possible time to reach Z = 18 minutes

So, there are two ways to reach point Z in minimum time, i.e. $A - B - C - Z$ and $A - E - Z$.

Hence, option (b) is the correct answer.

