

UPSC OPEN MOCK TEST-1 CSAT (SOLUTION)

Q 1. Ans: (a)

Explanation:

- (a) **Correct.** The passage states that the India–EU FTA resulted from years of dialogue balancing trade expansion with domestic sensitivities, implying cooperation succeeds through such balancing.
- (b) **Incorrect.** The passage indicates that sensitive sectors remain protected, showing that cooperation does not require eliminating all barriers.
- (c) **Incorrect.** The passage argues the opposite: continued multilateral engagement remains vital even after economic reforms.
- (d) **Incorrect.** The passage stresses that technologies like AI require governance, implying that multilateral frameworks remain important.

Q 2. Ans: (c)

Explanation:

- i. **Valid.** The passage mentions that the India–EU agreement emerged after balancing trade expansion with domestic sensitivities, implying such balance is necessary for cooperation.
- ii. **Valid.** The passage notes differences over climate commitments and regulatory approaches, yet emphasizes that multilateral engagement remains essential, indicating cooperation continues despite differences.

Q 3. Ans: (c)

Explanation:

- (a) **Incorrect.** The passage does not suggest that economic mobility improves automatically after crises. Instead, it argues that persistent inequality can continue to restrict mobility unless deliberate structural investments are made.
- (b) **Incorrect.** While the passage acknowledges that some communities demonstrated resilience during economic disruptions, it clearly states that resilience alone cannot replace structural opportunity creation.
- (c) **Correct.** This option reflects the main argument of the passage: rising inequality weakens economic mobility and can generate social frustration unless governments undertake sustained investments in health, education, and employment.
- (d) **Incorrect.** The passage recognizes that education, urban residence, and demographic advantages may improve advancement prospects, but it does not claim they are the primary or sufficient drivers of economic mobility.

Q 4. Ans: (a)

Explanation:

- i. **Valid.** The passage links persistent income inequality

with declining upward mobility and weaker intergenerational transitions, indicating that such constraints endure beyond temporary shocks like the pandemic.

- ii. **Invalid.** The passage emphasizes that sustainable stability requires targeted investments in health, education, and employment, implying that economic growth alone will not automatically reduce inequality or restore mobility.

Q 5. Ans: (c)

According to the question,

$$\frac{x^3 + x^2 + 16}{x} = x^2 + x + \frac{16}{x}$$

For this to be an integer, x must be a factor of 16. The positive divisors of 16 are: 1, 2, 4, 8, 16.

Number of such values = 5

Hence, answer is option (c).

Q 6. Ans: (b)

To find the number of positive integer triples (a, b, c) such that $abc = 30$, we use the prime factorization of 30:

$$30 = 2^1 \times 3^1 \times 5^1$$

For each prime, we have to assign it to one of the three numbers a, b, c .

Prime 2 can go to any of the 3 numbers \rightarrow 3 choices

Prime 3 \rightarrow 3 choices

Prime 5 \rightarrow 3 choices

Multiply the choices: $3 \times 3 \times 3 = 27$.

Hence, answer is option (b).

Q 7. Ans: (d)

Let a and b be consecutive integers.

So, let $a = n$ and $b = n + 1$.

Given $c = ab = n(n + 1)$.

Now,

$$I = a^2 + b^2 + c^2$$

Substitute and solve:

$$I = n^2 + (n + 1)^2 + [n(n + 1)]^2$$

$$I = n^2 + n^2 + 1 + 2n + n^2(n + 1)^2$$

$$I = 2n^2 + 2n + 1 + n^4 + n^2 + 2n^3$$

$$I = (n^2 + n + 1)^2$$

Thus, I is a perfect square.

Now check parity:

$n^2 + n$ is always even (product of consecutive integers).

So $n^2 + n + 1$ is odd.

Therefore, I is the square of an odd integer.

Hence, answer is option (d).

Q 8. Ans: (c)

Statement 1:

Cyclicity of 7 is 4 (repeats every 4): 7, 9, 3, 1, 7, 9, 3, 1...

Now divide 174 by 4:
 $174 \div 4 = 43$ remainder 2
 Unit digit corresponds to $7^2 \rightarrow 9$ not 7
 Thus, statement 1 is incorrect.

Statement 2:

Let odd numbers be:

$$a, (a+2)$$

Now,

$$(a+2)^2 - a^2 = a^2 + 4 + 4a - a^2 = 4(1+a)$$

Since a is odd, $a+1$ is even

So $a+1 = 2k$.

$$4(a+1) = 4 \times 2k = 8k$$

Thus, it is divisible by 8.

Thus, statement 2 is correct.

Statement 3:

Let consecutive odd numbers be:

$$(2n+1) \text{ and } (2n+3)$$

Now,

$$(2n+1)(2n+3) = 4n^2 + 8n + 3$$

On adding 1 to it:

$$4n^2 + 8n + 4 \text{ We can write it as:}$$

$$= 4(n^2 + 2n + 1) = 4(n+1)^2 = (2n+2)^2$$

Hence, it will be a perfect square.

Thus, statement 3 is correct.

Hence, answer is option (c).

Q 9. Ans: (d)

According to the question,

We know that,

$$\frac{M_1 \times D_1 \times H_1}{W_1} = \frac{M_2 \times D_2 \times H_2}{W_2}$$

Substituting:

$$\frac{x \times x \times x}{x} = \frac{y \times y \times y}{k}$$

$$k = \frac{y^3}{x^2} \text{ or } y^3 x^{-2}$$

Hence, answer is option (d).

Q 10. Ans: (d)

According to the information given, following table obtained,

Floor	Boy	Dish
8th	A	V
7th	D	T
6th	E	S / W
5th	F	Q
4th	C	P
3rd	G	U
2nd	H	R
1st	B	W / S

B lives on 1st floor and bought either W or S.

Hence, answer is option (d).

Q 11. Ans: (c)

Let number of students who likes:

None of the fruits = a

Exactly one fruits = b

Exactly two fruits = c

All three fruits = t

According to the question,

$$a + b + c + t = 100 \dots (i)$$

$$b + 2c + 3t = 73 + 80 + 52$$

$$b + 2c + 3t = 205 \dots (ii)$$

On subtracting eqn. (i) by eqn. (ii), we get

$$c + 2t - a = 105$$

Maximum value:

$$\text{Let } c = 1 \text{ and } a = 0$$

$$1 + 2t - 0 = 105$$

$$t = 52$$

Minimum value:

$$\text{Let } c = 95 \text{ and } a = 0$$

$$1 + 2t - 0 = 105 - 95$$

$$t = 5$$

$$\text{Difference} = 52 - 5 = 47$$

Hence, answer is option (c)

Q 12. Ans: (b)

Here, the number of students is less than the sum of the ranks of Kavya and Lucky.

When the sum of ranks > total students, they overlap.

So, we use the formula:

$$\text{Students in between} = (\text{Sum of ranks}) - \text{Total students} - 2$$

$$= (50 + 68) - 100 - 2 = 16$$

Hence, answer is option (c)

Q 13. Ans: (d)

Explanation:

i. **Incorrect.** The passage mentions tax incentives only as one measure among several, including demand stimulation, technological exploration reforms, and AI-enabled geospatial analysis. Hence, fiscal incentives are not presented as the principal instrument of sectoral transformation.

ii. **Incorrect.** The passage stresses building resilient domestic capacity but simultaneously recognizes the importance of stable regulations and international partnerships, indicating that reducing vulnerability does not require limiting international collaboration.

Q 14. Ans: (a)

Explanation:

i. **Valid.** The passage notes that geopolitical disruptions exposed vulnerabilities in mineral supply chains and emphasizes building resilient domestic capacity, implying that such geopolitical risks are expected to persist and influence strategic planning.

- ii. **Invalid.** Although the passage refers to tax incentives aimed at reducing prospecting risks, it does not suggest that fiscal concessions alone guarantee sustained private investment; other factors, such as demand stability, regulations, and technological capability, are also implied to be important.

Q 15. Ans: (b)

Explanation:

- (a) **Incorrect.** The passage does acknowledge efficiency gains from automation, but it clearly indicates that automation may reshape professional expectations and generate new concerns about competition and credibility.
- (b) **Correct.** The author highlights both sides of automation: increased efficiency through tools and coding, and emerging anxieties about disparities and professional relevance, making adaptation essential.
- (c) **Incorrect.** The passage explicitly states that journalism still depends on trust-building and contextual judgment, indicating that traditional practices remain important.
- (d) **Incorrect.** The passage does not suggest automation will create uniform reporting standards; instead, it discusses technological disruptions and professional adjustments.

Q 16. Ans: (a)

Explanation:

- i. **Valid.** Falling costs are mentioned as transformative. This presumes wider accessibility of automation tools across media professionals.
- ii. **Invalid.** Judgment and credibility remain essential in the passage. Complete algorithmic replacement of experiential evaluation is not implied.

Q 17. Ans: (b)

Let cost price = Rs. 100 per kg.

So, for 1000 g, customer pays Rs. 100.

But shopkeeper gives only 850 g, whose actual cost to him is:

$$\frac{850}{1000} \times 100 = \text{Rs. } 85$$

$$\text{Profit} = 100 - 85 = \text{Rs. } 15$$

$$\text{Required Profit \%} = \frac{15}{85} \times 100 = 17.65\%$$

Hence, answer is option (b).

Q 18. Ans: (a)

According to the question,

Riya's present age = 16 years

Her mother is 25 years older than Riya

$$\Rightarrow \text{Mother's present age} = 16 + 25 = 41 \text{ years}$$

Mother is 3 years younger than father

$$\Rightarrow \text{Father's present age} = 41 + 3 = 44 \text{ years}$$

Riya was born 4 years after her parents' marriage.

So, at the time of Riya's birth:

$$\text{Father's age} = 44 - 16 = 28 \text{ years}$$

Since she was born 4 years after marriage:

$$\text{Father's age at marriage} = 28 - 4 = 24 \text{ years}$$

Thus, statement 1 is correct.

$$\text{Value II: Age of Meeku} = 72 \text{ years}$$

Raman is 4 years younger than Meeku

$$\Rightarrow \text{Raman} = 72 - 4 = 68 \text{ years}$$

Raman is 4 years older than Trehan

$$\Rightarrow \text{Trehan} = 68 - 4 = 64 \text{ years}$$

Basant is 6 years younger than Trehan

$$\Rightarrow \text{Basant} = 64 - 6 = 58 \text{ years}$$

Now, age difference between Meeku and Basant: $72 - 58 = 14$ years not 18 years

Thus, statement 2 is incorrect.

Hence, answer is option (a).

Q 19. Ans: (b)

Value I:

According to the information given,

Students registered for:

$$\text{Reasoning} = 60$$

$$\text{Chemistry} = 85$$

$$\text{Both} = 45$$

Using the formula:

$$n(R \cup C) = n(R) + n(C) - n(R \cap C)$$

$$n(R \cup C) = 60 + 85 - 45 = 100$$

Students who registered neither:

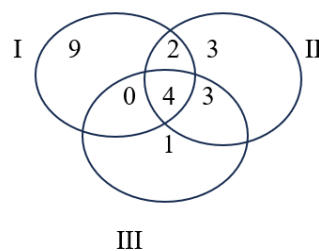
$$= \text{Total} - n(R \cup C)$$

$$= 260 - 100 = 160$$

$$\text{Value I} = 160$$

Value II:

According to the information given, following figure obtained:



Failed in exactly one stage only = $9 + 3 + 1 = 13$

$$\text{Value II} = 13$$

On comparing, we get:

$$\text{Value I} > \text{Value II}$$

Hence, answer is option (b).

Q 20. Ans: (a)

Let the HCF = H

$$\Rightarrow \text{LCM} = 28H$$

According to the question,

$H + 28H = 1740$
 $29H = 1740$
 $H = 60$
 So,
 $LCM = 28 \times 60 = 1680$
 $HCF = 60$
 Now,

$$\text{Other number} = \frac{HCF \times LCM}{\text{One number}}$$

$$= \frac{60 \times 1680}{240} = 420$$

Hence, answer is option (a).

Q 21. Ans: (a)

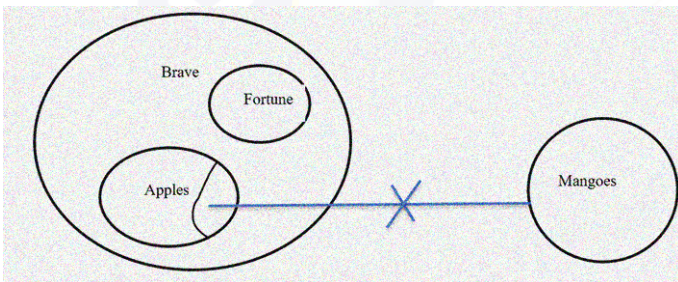
For any natural number n ,

$$x^n - a^n = (x - a)(x^{n-1} + x^{n-2}a + x^{n-3}a^2 + \dots + a^{n-1})$$

This identity is true for every positive integer n .
 Since $(x^n - a^n)$ can always be factored with $(x - a)$ as a factor,
 it is divisible by $(x - a)$ for all natural numbers n .
 Hence, answer is option (a).

Q 22. Ans: (b)

According to the given information,



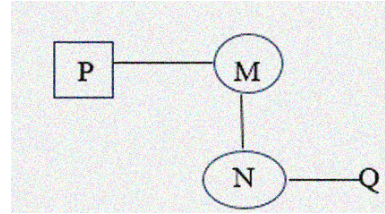
- I. All brave being mango is a possibility. [False]
 - II. All mango can be fortune. [True]
 - III. All brave is apple. [False]
- Hence, answer is option (b).

Q 23. Ans: (d)

According to the question,
 $P = Q \leq R < T \geq S = W$
 Since $Q = P$, conclusion II becomes $S > P$.
 But from the given statement, there's no direct relation
 between S and P , so we cannot say for sure if S is greater
 than P , equal to P , or smaller than P .
 Conclusion I: $P \geq S \rightarrow$ could be true.
 Conclusion II: $S > P \rightarrow$ could be true.
 So, either Conclusion I or Conclusion II will be true, but not
 both at the same time.
 Hence, answer is option (d).

Q 24. Ans: (c)

By going through the options,
 Check option (c):



Hence, answer is option (c).

Q 25. Ans: (d)

Explanation:

- (a) **Incorrect.** The text states metaphysics engages science while resisting reductionism. It does not portray metaphysics as primarily opposing scientific authority.
- (b) **Incorrect.** Debates on causation and free will are mentioned as areas of inquiry. The passage does not claim metaphysics conclusively resolves them.
- (c) **Incorrect.** Critics raise this concern, but defenders rebut it. The overall tone supports metaphysics' intellectual necessity rather than dismissing it.
- (d) **Correct.** This reflects part of the discussion, especially beyond empiricism. However, the passage also stresses conceptual clarification, not merely transcendence of science.

Q 26. Ans: (b)

Explanation:

- i. **Valid.** The passage states that conceptual clarification is indispensable for coherent knowledge, implying that metaphysics relies on conceptual analysis to illuminate fundamental ontological categories and commitments.
- ii. **Invalid.** The passage notes that philosophers dispute whether time flows or is tenselessly structured, indicating that metaphysics does not assume human temporal experience conclusively determines the objective structure of time.

Q 27. Ans: (b)

Explanation:

- (a) **Incorrect.** The passage mentions a single alleged case of misrepresentation but does not claim exaggeration is common across innovation summits.
- (b) **Correct.** The passage highlights concerns about misrepresentation and restricted participation, implying that transparency and inclusive engagement are essential for maintaining institutional credibility.
- (c) **Incorrect.** The passage refers to international observers attending the summit, but does not suggest that diplomatic engagement is the primary means of evaluation.
- (d) **Incorrect.** The passage mentions one alleged instance involving a university but does not generalize the issue to academic institutions broadly.

Q 28. Ans: (a)

Explanation:

- i. **Valid.** The passage presents two contrasting perspectives—critics concerned about discouraging dissent and supporters emphasizing the need to maintain order—implying that democratic balance involves reconciling these competing concerns.
- ii. **Invalid.** The passage does not claim that dissent inevitably undermines credibility; it only notes differing views regarding administrative responses to protests.

Q 29. Ans: (a)

We can write it as:

$$\begin{aligned} &= \frac{18^{1920} - 1^{1920}}{18} \\ &= (-1)^{1920} \end{aligned}$$

Then, on dividing 17^{1920} by 18, we get 1 as remainder.

Hence, answer is option (a).

Q 30. Ans: (b)

If a number is divisible by 9, the sum of its digits must be divisible by 9.

Sum = $3 + 8 + 7 + 9 + 7 + 5 + P + Q = 39 + P + Q$ is divisible by 9

Possible values of Q: 1, 3, 5, 7, 9 as it is given that last digit is odd

Possible pairs:

For Q = 1, P = 5

For Q = 3, P = 3

For Q = 5, P = 1

For Q = 7, P = 8

For Q = 9, P = 6

Thus, total pairs = 5

Hence, answer is option (b).

Q 31. Ans: (c)

We know that when two quantities increase by a% and b%, the net percentage increase is:

$$= a + b + \frac{ab}{100}$$

Here, percentage change in total collection

$$= 20 + 20 + \frac{20 \times 20}{100} = 44\%$$

Hence, answer is option (c).

Q 32. Ans: (b)

According to the question,

$$CI = P \left[\left(1 + \frac{r}{100} \right)^t - 1 \right]$$

y is the compound interest on x;

$$y = x \left[\left(1 + \frac{r}{100} \right)^t - 1 \right] \dots (i)$$

z is the compound interest on y;

$$z = y \left[\left(1 + \frac{r}{100} \right)^t - 1 \right] \dots (ii)$$

On dividing eqn. (i) by (ii), we get:

$$\frac{y}{z} = \frac{x}{y}$$

$$y^2 = zx$$

Hence, answer is option (b).

Q 33. Ans: (c)

According to the question,

Average of 14 students = 60

Total marks = $14 \times 60 = 840$

Statement I: There are 5 students in the group which left the class.

Marks removed = $5 \times 68 = 340$

Remaining = $840 - 340 = 500$

Number of students leaving known, but marks added unknown.

Thus, statement I is not sufficient

Statement II: Each of the two new students scored 25 marks.

Marks added = $2 \times 25 = 50$

But number of students who left unknown

Thus, statement II is not sufficient

On combining statements, I & II together:

Remaining marks = 500

New marks = $500 + 50 = 550$

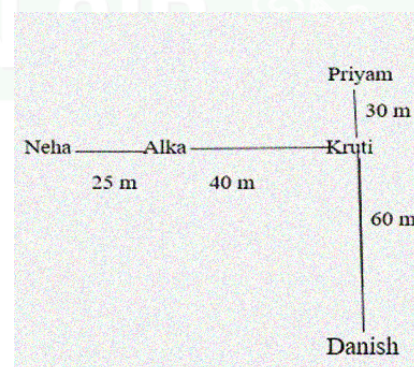
Students = $14 - 5 + 2 = 11$

$$\text{New average} = \frac{550}{11} = 50$$

Hence, answer is option (c).

Q 34. Ans: (b)

According to the given information, following figure obtained:



From the figure, only Priyam lies to the north-east of Neha. Hence, answer is option (b).

Q 35. Ans: (c)

By observing the pattern, we can conclude that code for:

R – T, U – V, I – O, N – J, E – Z, D – P

Also, code for Y – A, O – C, R – T, K – L, S – B

Hence, the code for SUNIYO – BVJOAC.

Hence, answer is option (c).

Q 36. Ans: (d)

According to the question,

Assign numbers to letters:

A = 0, B = 1, C = 2, ..., J = 9

Convert letters to numbers: JAG = 906, ADD = 033, FIG = 586

Now the expression:

$$JAG \times 2 - (ADD + FIG) = 906 \times 2 - (033 + 586) = 1812 - 619 = 1193$$

On converting 1193 to letters, we get: BBJD

Hence, answer is option (d).

Q 37. Ans: (d)

Explanation:

- Incorrect.** The text does not claim international law effectively restrains interventions. Instead, it suggests powers still act forcefully while invoking legal reasoning.
- Incorrect.** While rivalries test norms, the passage states the prohibition survived past conflicts. Therefore, decline is not presented as inevitable during geopolitical tensions.
- Incorrect.** The text notes expansion of self defence interpretations but questions their motives. It does not conclude that such doctrines ensure genuine accountability.
- Correct.** The passage argues that although frequently breached, international law survives through continued legal justification. Its endurance lies in compelling states to frame actions within normative discourse.

Q 38. Ans: (b)

Explanation:

- Invalid.** The passage notes that earlier interventions were justified through expanded interpretations of self-defence, indicating that such doctrines can be stretched to legitimize coercive actions rather than inherently preventing their misuse.
- Valid.** The passage emphasizes that states continue to invoke legal justifications for coercive actions, suggesting that maintaining legitimacy through justificatory discourse remains an important feature of international law.

Q 39. Ans: (d)

Explanation:

- Incorrect.** Although neuroscience is discussed, the

passage does not prioritize reductionism. Metaphysical uncertainty remains central rather than being subordinated.

- Incorrect.** Artificial intelligence is mentioned as an extension of debate. However, it is not presented as the central organizing concern.
- Incorrect.** Identity theory appears as one interpretative strand among many. The passage does not claim conceptual clarity resolves the broader controversy.
- Correct.** The passage surveys diverse philosophical positions without endorsing resolution. It stresses that scientific progress has not eliminated enduring conceptual disagreement.

Q 40. Ans: (a)

Explanation:

- Valid.** The passage examines multiple theories explaining consciousness—dualism, physicalism, functionalism, and identity theory—indicating that consciousness is treated as a real phenomenon requiring philosophical explanation rather than being dismissed as illusory.
- Invalid.** The passage explicitly states that interactionism struggles to explain causal exchange between mental and physical substances, indicating that dualism does not provide a clear causal mechanism.

Q 41. Ans: (c)

Let total work = 1

Let 1 man's 1 day work = m

Let 1 woman's 1 day work = w

From I:

10 men finish in 6 days

$$60m = 1 \Rightarrow m = \frac{1}{60}$$

From II:

$$(10m + 10w) \frac{24}{7} = 1$$

From III:

$$30m + 40w = 1$$

Now,

From I + II:

$$\text{Substitute } m = \frac{1}{60}$$

$$\frac{1}{6} + 10w = \frac{7}{24}$$

$$10w = \frac{1}{8} \Rightarrow w = \frac{1}{80}$$

10 women do work in:

$$\frac{1}{10w} = 8 \text{ days}$$

Thus, I & II together are sufficient
From I + III:

$$\frac{1}{2} + 40w = 1 \Rightarrow w = \frac{1}{80}$$

Thus, I & III together are sufficient
II + III:

Using II and III we can solve two equations in m and w.
So, any two statements are sufficient to answer the question.
Hence, answer is option (c).

Q 42. Ans: (a)

Logic used:

$$16 \times .5 = 8$$

$$8 \times 1 = 8$$

$$8 \times 1.5 = 12$$

$$12 \times 2 = 24$$

$$24 \times 2.5 = 60$$

Hence, answer is option (a).

Q 43. Ans: (c)

Logic used: addition of prime numbers starting from 2

$$18 + 2 = 20$$

$$20 + 3 = 23$$

$$23 + 5 = 28$$

$$28 + 7 = 35$$

$$35 + 11 = 46$$

$$46 + 13 = 59$$

Hence, answer is option (c).

Q 44. Ans: (c)

The given sequence of numbers is:

5 5 4 7 1 9 6 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 6 9 8 5 7

(5,5) (7,1) (1,9) (5,7) (3,1) (1,5) (5, 7)

Hence, answer is option (c).

Q 45. Ans: (c)

Given:

$$P(A) = \frac{1}{7}, P(N) = \frac{1}{5}$$

$$(a): \text{Probability both selected} = \frac{1}{7} \times \frac{1}{5} = \frac{1}{35}$$

(b) Probability none selected

$$P(A \text{ not}) = 1 - \frac{1}{7} = \frac{6}{7}$$

$$P(N \text{ not}) = 1 - \frac{1}{5} = \frac{4}{5}$$

$$P(\text{None}) = \frac{6}{7} \times \frac{4}{5} = \frac{24}{35}$$

(c) Probability at least one selected:

$$= 1 - P(\text{None})$$

$$= 1 - \frac{24}{35} = \frac{11}{35}$$

Hence, answer is option (c).

Q 46. Ans: (c)

We know that,

$$\text{Total} = \text{position from top} + \text{position from bottom} - 1$$

Here:

Descending \rightarrow 10th from top

Ascending \rightarrow 20th from bottom

So,

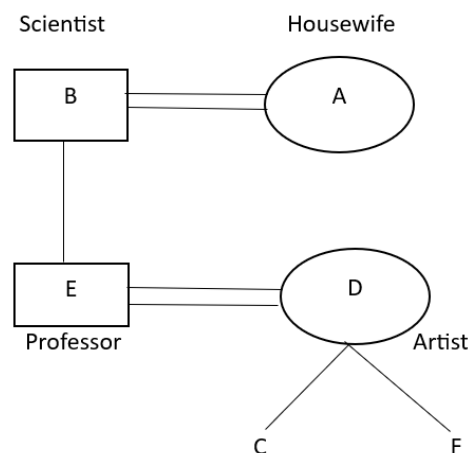
$$\text{Total} = 10 + 20 - 1 = 29$$

Thus, both the statements together are needed to answer the question.

Hence, answer is option (c).

Q 47. Ans: (a)

According to the question, the following family tree obtained:



Statement 1: From the above tree, we can see that A is the grandmother of F

Thus, statement 1 is correct.

Statement 2: From the above tree, we can see that C & F are siblings not cousins

Thus statement 2 is incorrect.

Hence, answer is option (a).

Q 48. Ans: (b)

Replace the symbols and solve using BODMAS:

$$= 24 \div 8 - 5 + 6 \times 3$$

$$= 3 - 5 + 18$$

$$= 16$$

Hence, answer is option (b).

Q 49. Ans: (d)

Explanation:

- (a) **Incorrect.** Constitutional continuity contributes to legality, not necessarily legitimacy. The text differentiates lawful authority from socially accepted authority.
- (b) **Incorrect.** Crises expose legitimacy gaps but do not define its primary basis. Legitimacy operates continuously, not only during visible instability.
- (c) **Incorrect.** The text contrasts legitimacy with coercion and fear. It suggests coercive enforcement indicates weakened, not stabilized, legitimacy.
- (d) **Correct.** The passage argues that electoral victory and procedure alone are insufficient. It conveys that deeper moral acceptance must anchor authority for sustainable governance.

Q 50. Ans: (c)

Explanation:

- i. **Valid.** The passage notes that performance legitimacy arises from welfare delivery and institutional effectiveness, and that modern states cultivate transparency and accountability. This implies that legitimacy requires continual reinforcement through responsive governance.
- ii. **Valid.** The passage notes that performance legitimacy arises from welfare delivery and institutional effectiveness, and that modern states cultivate transparency and accountability. This implies that legitimacy requires continual reinforcement through responsive governance.

Q 51. Ans: (d)

Explanation:

- i. **Incorrect.** The text rejects heavy industrial replication models explicitly. Therefore, favoring large manufacturing contradicts the developmental logic presented.
- ii. **Incorrect.** Consumption from remittances is described as sustaining households. However, the passage promotes structural innovation, not consumption-led growth.

Q 52. Ans: (a)

Explanation:

- i. **Valid.** The passage prioritizes literacy and advanced sectors over land-intensive industry. This rests on the belief that knowledge capital can compensate for physical limitations.
- ii. **Invalid.** Remittances are described as limiting structural transformation. The argument does not rely on them guaranteeing long-term resilience.

Q 53. Ans: (c)

Logic used:

$$2^3 - 2^2 = 8 - 4 = 4$$

$$3^3 - 3^2 = 27 - 9 = 18$$

$$4^3 - 4^2 = 64 - 16 = 48$$

$$5^3 - 5^2 = 125 - 25 = 100$$

$$6^3 - 6^2 = 216 - 36 = 180$$

Q 54. Ans: (c)

Since $24 = 3 \times 8$, the number must be divisible by both 3 and 8.

Last three digits are $25q = 250 + q$.

250 leaves remainder 2 when divided by 8, so we must add 6 to make it divisible by 8.

Therefore, $q = 6$.

Now,

Sum of digits of $p01256 = p + 14$.

Since 14 leaves remainder 2 when divided by 3, p must leave remainder 1 when divided by 3.

Possible values: $p = 1, 4, 7$.

Hence possible pairs: (1,6), (4,6), (7,6)

Total combinations = 3.

Hence, answer is option (c).

Q 55. Ans: (d)

Given:

$$10a + b = ab + a + b \quad 10a = ab + a \quad 9a = ab \quad \text{So, } b = 9$$

Now check two-digit perfect square: $10a + 9$

Try $a = 1, 4, 9$

Only $a = 4$ gives 49 (perfect square).

Thus:

$$a = 4, b = 9$$

Now,

$$[ba - (b + a)] = [94 - (9 + 4)] = 81$$

Also,

$$b^2 = 9^2 = 81$$

Since both option (b) and option (c) give 81,

Hence, answer is option (d).

Q 56. Ans: (c)

Let the six two-digit consecutive odd numbers be:

$$(n-5), (n-3), (n-1), (n+1), (n+3), (n+5)$$

Sum of these six numbers =

$$(n-5) + (n-3) + (n-1) + (n+1) + (n+3) + (n+5) = 6n$$

When divided by 10, the sum becomes a perfect square: $\frac{6n}{10}$

For this to be a whole number, n must be divisible by 5.

So, let:

$$n = 5k$$

Then,

$$\frac{6n}{10} = \frac{6(5k)}{10} = 3k$$

Now, $3k$ must be a perfect square

If $k = 12$,
 Then, $3k = 36$ which is a perfect square.
 So, $n = 5k = 5 \times 12 = 60$
 Thus, the six numbers become: 55, 57, 59, 61, 63, 65
 Hence, answer is option (c).

Q 57. Ans: (c)

According to the question,
 Total routes from Mumbai to Nagpur = 3
 Total routes from Nagpur to Kolkata = 6
 Thus, required total ways to reach Kolkata from Mumbai =
 $3 \times 6 = 18$ ways.

Q 58. Ans: (b)

Pattern used: Addition of place values
 If vowel \rightarrow take the place value of its opposite letter
 If consonant \rightarrow take its normal place value
 Place values:

V	O	L	U	M	E	E	A	R	P	H	O	N	E
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
22	12	12	6	13	22	22	26	18	16	8	12	14	22

Their sum:
 VOLUME = $22 + 12 + 12 + 6 + 13 + 22 = 87$
 EARPHONE = $22 + 26 + 18 + 16 + 8 + 12 + 14 + 22 = 138$
 Similarly,
 Code for BOTTLE = $2 + 12 + 20 + 20 + 12 + 22 = 88$
 Hence, answer is option (b).

Q 59. Ans: (d)

Pattern used: In each step, one letter gets repeated, and the repeated letter shifts one position towards the left in successive groups.
 j k l m n n / j k l m m n / j k l l m n / j k k l m n / j j k l m n
 Thus, required result is: lnmnlkj
 Hence, answer is option (d).

Q 60. Ans: (c)

Angle between two hands:

$$\theta = \frac{11}{2}M - 30H$$

Here, $H = 2$ and $\theta = 90^\circ$

$$90^\circ = \frac{11}{2}M - 30 \times 2$$

$$\frac{11}{2}M = 150$$

$$M = \frac{300}{11} = 27 \frac{3}{11}$$

Hence, answer is option (c).

Q 61. Ans: (b)

Explanation:

- (a) **Incorrect.** The passage does not suggest demographic pressures were already dominant. Instead, it links heightened vulnerability specifically to climate-induced habitat instability.
- (b) **Correct.** This option integrates climate disruption with moulting vulnerability and population consequences. The passage consistently emphasizes intensified risks during a biologically critical life stage.
- (c) **Incorrect.** Although ecological fragility is implied, the focus remains species-specific. The argument centers on emperor penguins during moulting, not entire Antarctic ecosystems.
- (d) **Incorrect.** The passage highlights vulnerability rather than successful behavioural adaptation. Relocation and flexibility remain uncertain rather than established outcomes.

Q 62. Ans: (a)

Explanation:

- i. **Valid.** The passage attributes heightened vulnerability to warming trends. This presumes climate change exceeds ordinary environmental fluctuation cycles.
- ii. **Invalid.** Relocation is mentioned as uncertain, not compensatory. The passage does not assume adaptive movement neutralizes climate risks.

Q 63. Ans: (d)

Explanation:

Incorrect. Although plausible, the passage does not explicitly indicate conflicting legal regimes as the root cause. The focus remains on exclusion and customary dominance.
Incorrect. The judgment emphasizes Parliament's authority, not judicial expansion. Hence, reform is not portrayed as dependent exclusively on judicial reinterpretation.

Q 64. Ans: (d)

Aggregate percentage marks of P = $50 + 60 + 40 + 60 = 210$
 Aggregate max marks = $100 + 100 + 100 + 50 = 350$
 $210/350 = 3/5 = 60\%$
 Aggregate percentage marks Q: Agg marks =
 $80 + 75 + 60 + 10 = 225$
 Aggregate max marks = $150 + 100 + 100 + 25 = 375$
 $225/375 = 3/5 = 60\%$
 Difference in aggregate percentage marks = 0
 Hence, answer is option (d)

Q 65. Ans: (a)

Value I:
 As we know that,

$$\text{Distance} = \frac{\text{Speed1} \times \text{Speed2}}{\text{Speed1} + \text{Speed2}} \times \text{Time}$$

Here, Speed 1 = 5 km/h

Speed 2 = 3 km/h

Time = 8 hours

$$\Rightarrow \text{Distance} = \frac{5 \times 3}{5 + 3} \times 8$$

$$\Rightarrow \text{Distance} = 15 \text{ km}$$

Value II:

Total time difference = 15 minutes

According to the question,

$$\text{Distance} = \frac{S1 \times S2}{S1 - S2} \times \text{Time difference}$$

$$\Rightarrow \text{Distance} = \frac{30 \times 40}{10} \times \frac{15}{60}$$

$$\Rightarrow \text{Distance} = 30 \text{ km}$$

On comparing, we get:

Value I < Value II

Hence, answer is option (a).

Q 66. Ans: (c)

Given: $4x523z$ is completely divisible by 88

Means, the number will be divisible by 11 and 8.

Therefore, $23z$ is divisible by 8 only if $z = 2$

Now, $4 + x - 12 = x - 8$, it should be a multiple of 11 or 0.

$$x = 8$$

$$x + 2z = 8 + 4 = 12 = 5 + 7 \text{ (sum of two consecutive prime numbers)}$$

Hence, answer is option (c).

Q 67. Ans: (d)

Total birds = 15

If no three are collinear, total lines = ${}^{15}C_2 = 105$

Now 4 birds lie on the same straight line.

Normally, 4 birds would form: ${}^4C_2 = 6$ lines, but now they form only 1 line.

So, extra lines counted = $6 - 1 = 5$

Maximum distinct lines = $105 - 5 = 100$

Hence, answer is option (d)

Q 68. Ans: (d)

Important property:

If n is composite, then a_n is composite.

Also, if n is a multiple of 3, then a_n is divisible by 3.

Now check each case:

(i) a_{741}

$$741 = 3 \times 247$$

So 741 is composite (also divisible by 3).

Therefore, a_{741} is not prime.

(ii) a_{534}

$$534 = 2 \times 267$$

Composite (also divisible by 3).

So a_{534} is not prime.

(iii) a_{123}

$$123 = 3 \times 41$$

Composite.

So a_{123} is not prime.

(iv) a_{77}

$$77 = 7 \times 11$$

Composite.

So a_{77} is not prime.

Option d follows since only this supports that all these three are not prime.

Hence, answer is option (d)

Q 69. Ans: (d)

The year 2017 & 2018 are non-leap years,

2017 \rightarrow 2018 = 365 days (not leap year) \rightarrow +1 odd day

2018 \rightarrow 2019 = 365 days (not leap year) \rightarrow +1 odd day

Move 2 days ahead from Friday: Friday + 2 = Sunday

Hence, answer is option (d).

Q 70. Ans: (b)

According to the question,

Total number of pieces obtained with X cuts in x-axis, Y

cuts in y-axis and Z cuts in z-axis

$$= (X + 1) \times (Y + 1) \times (Z + 1)$$

This would be least when the number 150 is broken into three factors as close to each other as possible.

Thus, total number of cuts =

$$150 = 5 \times 5 \times 6 = (X + 1) \times (Y + 1) \times (Z + 1)$$

$$= (4 + 1) \times (4 + 1) \times (5 + 1)$$

Least possible number of cuts = $4 + 4 + 5 = 13$

Hence, answer is option (b).

Q 71. Ans: (c)

Solve such questions by hit and trial method

Let's take option c,

$$\text{L.H.S} = 9 + 29 + 93 + 49 + 91 + 98 = 369 = \text{R.H.S}$$

Hence, value of \bullet is 9

Hence, answer is option (c)

Q 72. Ans: (a)

Explanation:

- (a) **Correct.** This correctly follows because the passage concludes functional capability matters more than structural similarity. It logically extends the argument that perfect biological imitation is unnecessary.
- (b) **Incorrect.** This is incorrect because the passage emphasizes persistent fundamental differences. It does not suggest convergence will eliminate architectural distinctions between artificial and biological intelligence.
- (c) **Incorrect.** This is incorrect though plausible because neuromorphic hardware is only one avenue. The passage frames progress as broader and not dependent on perfect hardware replication.
- (d) **Incorrect.** This is incorrect because biological neurons are described as far more complex. The passage does not imply artificial neurons will soon match their full richness.

Q 73. Ans: (c)

Explanation:

- i. **Valid.** Despite imperfections, the text treats current efforts as meaningful progress. Therefore, it assumes AI-biology convergence research retains strategic value without full neurobiological matching.
- ii. **Valid.** The concluding emphasis on functional capability over resemblance supports this. The passage assumes evaluation increasingly values performance outcomes more than structural mimicry.

Q 74. Ans: (b)

Explanation:

- (a) **Incorrect.** This is incorrect because the passage does not advocate expanding prohibitions. It focuses on misuse and overreach rather than insufficiency of formal restrictions.
- (b) **Correct.** This best reflects the passage's emphasis on careful, balanced discretion. The author stresses preserving democratic debate while maintaining decorum through nuanced regulatory judgment.
- (c) **Incorrect.** This is incorrect though subtle because political culture is not the focus. The passage centres on regulatory balance and institutional credibility concerns.
- (d) **Incorrect.** This is incorrect because the text warns against excessive expunction. Uniformly stringent deletion contradicts the call for calibrated and context-sensitive discretion.

Q 75. Ans: (c)

Explanation:

- i. **Valid.** The passage emphasizes careful discretion rather than mechanical rule application. This implies effective parliamentary speech regulation assumes qualitative judgment materially shapes deliberative outcomes.
- ii. **Valid.** Warnings against overuse imply proportionate intervention is necessary. Therefore, parliamentary speech regulation assumes equilibrium improves when expunction thresholds remain context-sensitive.

Q 76. Ans: (c)

Total marks = $71 + 76 + 80 + 82 + 91 = 400$

For the average to be an integer after each entry:

After 2 marks → sum must be divisible by 2

After 3 marks → sum divisible by 3

After 4 marks → sum divisible by 4

Checking divisibility by 3:

Only the three numbers 76, 82, 91 have a sum divisible by 3 ($76 + 82 + 91 = 249$)

So, these must be the first three entries.

Remaining numbers: 71 and 80

Now check divisibility by 4:

$249 + 71 = 320 \rightarrow$ divisible by 4

$249 + 80 = 329 \rightarrow$ not divisible by 4

So, the 4th mark = 71 and the 5th mark = 80

Hence, answer is option (c)

Q 77. Ans: (d)

According to the question,

$8 \leq x \leq 15$ and $2 \leq y \leq 6$

Maximum value of $(x + y)$:

$\Rightarrow x = 15$ & $y = 6$

$\Rightarrow (x + y) = 15 + 6 = 21$

Minimum value of $(x - y)$:

$\Rightarrow x = 8$ & $y = 6$

$\Rightarrow (x - y) = 8 - 6 = 2$

Ratio of $(x + y)$: $(x - y)$

$\Rightarrow 21 : 2$

Hence, answer is option (d).

Q 78. Ans: (d)

The grants form a Geometric Progression with

$$a = 20,000, r = \frac{11}{10}$$

Number of years from 2018 to 2022 = 5

$$\text{Grant in 2022 (4 years after 2018)} = 20,000 \left(\frac{11}{10} \right)^4$$

= Rs. 29,282

(ii) We know that:

$$\text{Sum of first } n \text{ terms of a GP: } S_n = a \frac{r^n - 1}{r - 1}$$

$a = 20,000$

$r = 11/10$

From 2018 to 2022 inclusive = 5 years, so $n = 5$

$$S_5 = 20000 \frac{\left(\left(\frac{11}{10} \right)^5 - 1 \right)}{\frac{11}{10} - 1}$$

$$S_5 = 20000 \left[\frac{61051}{100000} \times 10 \right]$$

= Rs. 122,102

Hence, answer is option (d).

Q 79. Ans: (c)

If we see at the given figure, there are 10 small triangles

Similarly, there are 11 big triangles

Thus, total number of triangles = $10 + 11 = 21$

Hence, answer is option (c)

Q 80. Ans: (d)

1st Row:

Middle term = $2(21 + 15) = 72$

2nd Row:

Middle term: $2(19 + 37) = 112$

3rd Row:

Middle term: $2(23 + 7) = 60$

Thus, value of $X = 60$

Hence, answer is option (d)