

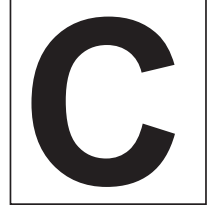
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**NEXT IAS**

Test Booklet Series



परीक्षण पुस्तिका अनुक्रम

# अनुभव-2024

## ALL INDIA OPEN MOCK TEST-1

### CSAT (Paper-II)

#### Answer Key

- |         |         |         |         |         |
|---------|---------|---------|---------|---------|
| 1. (c)  | 17. (b) | 33. (b) | 49. (a) | 65. (d) |
| 2. (d)  | 18. (d) | 34. (d) | 50. (b) | 66. (b) |
| 3. (c)  | 19. (a) | 35. (a) | 51. (c) | 67. (b) |
| 4. (d)  | 20. (b) | 36. (d) | 52. (b) | 68. (c) |
| 5. (b)  | 21. (d) | 37. (c) | 53. (c) | 69. (a) |
| 6. (c)  | 22. (d) | 38. (b) | 54. (d) | 70. (a) |
| 7. (c)  | 23. (a) | 39. (b) | 55. (c) | 71. (d) |
| 8. (b)  | 24. (c) | 40. (d) | 56. (a) | 72. (d) |
| 9. (a)  | 25. (a) | 41. (c) | 57. (d) | 73. (c) |
| 10. (d) | 26. (a) | 42. (b) | 58. (c) | 74. (b) |
| 11. (c) | 27. (b) | 43. (b) | 59. (a) | 75. (b) |
| 12. (c) | 28. (c) | 44. (a) | 60. (c) | 76. (b) |
| 13. (b) | 29. (c) | 45. (d) | 61. (a) | 77. (d) |
| 14. (c) | 30. (b) | 46. (a) | 62. (b) | 78. (b) |
| 15. (c) | 31. (b) | 47. (c) | 63. (b) | 79. (d) |
| 16. (b) | 32. (d) | 48. (b) | 64. (b) | 80. (b) |

## EXPLANATIONS

1. (c)

Option (a) is not correct because it states modified foods alone will help India.

Option (b) is not correct because the passage only states if India wants to upscale its production. This does not tell us if 'can help India transform its agro-economy.

Option (c) is correct because the passage states that if India wants to upscale its production, then we will need to adopt emerging technologies.

Option (d) is not correct because it extends beyond the scope of the passage.

2. (d)

The passage addresses the fact that a red filter could remove some blue light in black and white photography, so statement (d) is most logical statement.

3. (c)

Option (c) indicates the importance of organization and design. The other choices, even if true, are not in the passage.

4. (d)

Option (d) is the correct choice.

Option (a) is not correct because the passage clearly states that legality that must be met to dispossess an individual of their property.

Option (b) is not correct because it essentially states that 'every state will evade...'. This is contradictory to the passage.

Option (c) is not correct because the passage does not discuss criminal offences.

Option (d) is correct because the passage essentially highlights the high threshold of legality that must be met to dispossess an individual of their property.

5. (b)

Let a, b, c, d be the average weights of players in sports A, B, C, D respectively.

The average weight of all the players from the given conditions

$$= \frac{65(a+b+c) + 75(a+c+d) + 70(a+b+d) + 80(b+c+d)}{3(a+b+c+d)}$$

$$= 70 + \frac{5b+10c+15d}{3(a+b+c+d)}$$

Clearly, a, b, c, d are natural numbers.

Put  $a = b = c = d = 1$

$$\text{Then, required average} = 70 + \frac{30}{12}$$

$$70 + 2.5 = 72.5$$

6. (c)

Total number of passengers in the Rajdhani Express =  $15 \times 30 = 450$

For maximum passengers in one bogie there should be minimum number of passengers in other 14 bogies.

So, in the 14 bogies the minimum number of total passengers

$$= 14 + 15 + 16 + 17 + 18 + 19 + 20 + 21 + 22 + 23 + 24 + 25 + 26 + 27 = 287$$

Another way for this calculation is

$$a = 14; d = 1; n = 14; S_n = \frac{14}{2} [28 + 13 \times 1] = 287$$

Hence, the maximum number of passengers in one bogie as per the given conditions can be  $(450 - 287) = 163$ .

7. (c)

Let the first term and the common difference of the arithmetic progression be a and d respectively.

The

sum of the first 91 terms is 0,

$$\text{i.e., } \frac{91}{2} [2a + 90d] = 0$$

$$91[a + 45d] = 0$$

$$\Rightarrow \text{This is in the form of } a + (n-1) \times d$$

$$= a + (46-1)d = 0$$

$\therefore$  The 46<sup>th</sup> term of the arithmetic progression must be 0.

8. (b)

The possible number of men and women and the

corresponding number of ways in which the committee can be selected are tabulated below.

Men	Women	Number of selection
7	5	6 members
4	2	${}^7C_4 \cdot {}^5C_2$
5	1	${}^7C_5 \cdot {}^5C_1$
6	0	${}^7C_6 \cdot {}^5C_0$

Therefore total number of ways that the committee formed is

$${}^7C_4 \cdot {}^5C_2 + {}^7C_5 \cdot {}^5C_1 + {}^7C_6 \cdot {}^5C_0$$

$$= 35(10) + 21(5) + 7(1)$$

$$= 350 + 105 + 7 = 462$$

9. (a)

The sum of all n-digit numbers that can be formed using n distinct positive digits is

$$(n-1)! \times \underbrace{111\dots 1}_{n \text{ times}} \times (\text{sum of all digits})$$

Hence the required sum is

$$3! \times 1111 \times [5 + 4 + 7 + 8] = 159984$$

10. (d)

11. (c)

**Option (c) is the correct choice.**

**Option (a) is not correct** because the passage does not mention 'in-depth analysis of the factors involved'.

**Option (b) is not correct** because the passage mentions that risks, costs and who should bear the costs are three factors that need to be considered for an effective deal.

**Option (c) is correct** because it mentions that to mitigate risks costs should be distributed ethically. This is underlying message of the passage.

**Option (d) is not correct** because 'The economics of climate change need to be addressed' extends beyond the scope of the passage.

12. (c)

Option (c) is the correct answer as the passage argues about it in the last lines of the paragraph.

The last line makes this difference in efficiency parameters evident.

Option (a) is not a logical inference. The passage does not provide the linkage between banking reforms and employment generation.

Option (b) is an incorrect answer as the passage does not argue about the exclusion of masses before the reforms.

Option (d) is incorrect as the passage does not talk about the better returns to the government.

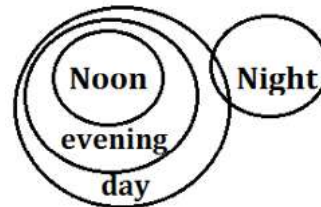
13. (b)

**Option (b) is the correct choice.**

**Assumption (1) is not valid** because the passage does not discuss a 'single global framework'. The passage discusses a more collaborative approach to data security.

**Assumption (2) is valid** because the passage has mentioned 'finding suitable solutions ... will require ... collaboration ... dialogue ... involvement of developing countries'.

14. (c)



15. (c)

VOICE when all vowels are together =  $3! \times 3!$   
= 36 words.

Total words from ENGLISH =  $7! = 5040$

Words from ENGLISH when all vowels are not together

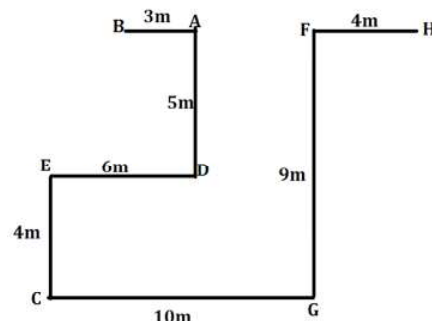
$$= 5040 - [\text{when all vowels are together}]$$

$$= 5040 - [6! \times 2] = 3600$$

$$\therefore \text{Required difference} = 3600 - 36 = 3564$$

16. (b)

F is 9m north of G, E is 4m north of C, B is 3m west of A, H is 4m east of F, C is 10m west of G, D is 6m east of E, D is 5m south of A.



17. (b)

Mid point of ED is 3 meters away from E. From the figure the distance is  $3 + 4 = 7\text{m}$

18. (d)

**Case 1:** One digit as five

Fixing one digit to be five. The other two digits can vary in nine ways from 0 to 9 (excluding 5) and position of 5 can be fixed in 3 ways.

$\therefore$  The number of 2-digit and 3-digit numbers having only one 5 is  $3(9)(9) = 243$

**Case 2:** Two digits as five

5 5(9)

The position of non-five digit can be fixed in 3 ways.

The number of 2-digit and 3-digit numbers having exactly. Two 5's is  $3(9) = 27$

**Case 3:**

5 5 5

The number of numbers having exactly three 5s is 1.

$\therefore$  The total number of times 5 occurs, in all possible natural numbers less than 1000 is

$$243 + 2(27) + 3(1) = 300$$

The number of times 5 occurs in between 9 to 1000 is  $300 - 1 = 299$  (excluding 5 because there is a possibility of 005 in case 1)

19. (a)

The final unit digit depends on the constituent unit digits and mathematical operation.

$$(7834)^{1793} \times (925)^{317} \times (741)^{471}$$

$$\Rightarrow (4)^{1793} \times (5)^{317} \times (1)^{471}$$

Since, 4 has a cyclicity of 2, the above equation can be reduced to

$$= (4)^{1792+1} = 4$$

$$= 4 \times 5 \times 1 = 20$$

Hence, (a) is correct answer.

20. (b)

$$= \left[ 5 + \frac{1}{3} \left\{ 30 - (19 + 4) + \frac{1}{2} \text{ of } 64 \right\} + 6 \right]$$

$$= \left[ 5 + \frac{1}{3} \text{ of } \{30 - 23 + 32\} + 6 \right]$$

$$= \left[ 5 + \frac{1}{3} \text{ of } \{39\} + 6 \right]$$

$$= [5 + 13 + 6] = 24$$

21. (d)

Statement (1) is incorrect because of the lack of evidence in the passage to support it.

Statement (2) is incorrect, though the Chinese shifted to Maoism after the British insurgence, it can't be said that they were forced to by the British. Hence, the correct answer is option (d).

22. (d)

Option (a) is incorrect because the passage says that the freezing point of their bodily fluids is lowered and not that they cannot freeze.

Option (b) is negated because the passage does not say anything about their ability to survive in warm temperatures. The passage states that the rat hearts could be preserved only for 24 hours and the AFPs backfired at colder temperatures. So, AFPs may not be the solution for preserving organs, making option (c) incorrect.

Option (d) is the correct answer because the AFPs which are found in icefish have been used for research. Hence, we can conclude that Antarctic icefish have been a part of medical research.

23. (a)

(a) These two processes match two of the four listed in the second sentence of the paragraph.

(b) According to the passage, these two processes are associated with norepinephrine, not serotonin.

(c) Only appetite is associated with serotonin; alertness is associated with norepinephrine.

(d) Only mood is associated with serotonin; mental focus is associated with norepinephrine.

24. (c)

(a) While it might be reasonable to assume that the four stages generally occur in order, the passage does not provide any information to infer that the fourth stage occurs only after passing through the first three.

(b) The passage provides no information about whether parasomnias occur during stage 4.

- (c) The sixth sentence of the paragraph says that the non-REM stages are not associated with normal dreaming. The seventh sentence then says that "the fourth stage, REM...is strongly associated with dreaming."
- (d) The passage does say that certain neurotransmitter levels "drop virtually to zero" during the fourth stage. The passage does not indicate, however, that the levels "fluctuate" during that stage.

25. (a)

From I, let present age of Ayush be  $x$  year and age of his brother be  $2x$  year.

From I and II, we get  $\frac{x+6}{2x+6} = \frac{7}{8}$

$$\Rightarrow 8x + 48 = 14x + 42$$

$$\Rightarrow x = 1 \text{ year}$$

Hence, I and II is sufficient to answer the question.

26. (a)

Let the number of sides in the polygon be  $n$ .

$$\text{No. of diagonals, } \frac{n(n-3)}{2} = 4n$$

$$n > 0$$

$$n - 3 = 8$$

$$\therefore n - 11 = 0$$

$$\therefore n = 11$$

27. (b)

Let the initial amount =  $A$

Cost of 1 apple =  $(A/20)$

Cost of 1 orange =  $(A/12)$

Cost of 1 watermelon =  $(A/5)$

As all three types of fruits are bought, the minimum shall be one.

As oranges are to be maximum, others are one each.

Amount spent =  $10A$  (as per data).

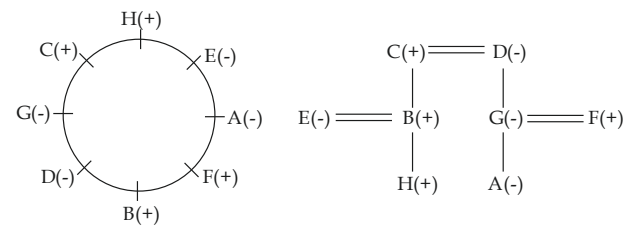
Hence, the number of oranges

$$= \left\{ 10A - \frac{A}{20} + \frac{A}{5} \right\} \div \frac{A}{12}$$

$$= \left\{ 10A - \frac{A}{4} \right\} \times \frac{12}{A} = \frac{39A}{4} \times \frac{12}{A} = 39 \times 3$$

$$= 117$$

Solutions (28-30):



28. (c)

29. (c)

30. (b)

31. (b)

Option (a) is not correct because it states that farmers are unaffected by these factors.

Option (b) is correct because the passage assumes that the government's policies on urea pricing are influenced by political considerations, as urea has continued to be a political hot potato for successive governments.

Option (c) is not correct because the passage does not mention efficiency of alternative fertilisers.

Option (d) is not correct because the passage does not indicate whether this will be automatic or may involve some behavioural changes on parts of farmers.

32. (d)

Statement (1) is valid as the passage states that '...urea, the primary cause of worsening plant nutrient imbalance', then we are told that there is 'declining nitrogen use efficiency and crop yield response to fertilisers'. From this we can infer that the urea is the primary cause of crops response being negatively impacted.

Statement (2) is not valid as the passage does not discuss the efficiency of fertilisers.

Statement (3) is valid as the passage discusses that: The MRP of urea has been unchanged.

Statement (4) is not valid as the passage does not tell us that the diesel costs have stopped having any political impact.

33. (b)

Option (a) is not correct because it states improved soil health.

Option (b) is correct because the passage has mentioned both as negative impacts of urea.

Option (c) is not correct because soil health 'changes' is vague. It does not indicate whether it is negative or positive.

Option (d) is not correct because the passage does not mention these.

34. (d)

The passage states that "the true cost of renewable sources (solar, wind, and nuclear) remains much more than that of fossil-fuel power." However, this statement alone does not provide a full picture of the long-term cost-effectiveness of renewable energy sources. Later in the passage, it is suggested that industrialized nations are falling short on their commitments to transfer technology and finance to developing countries to accelerate clean energy adoption. This implies that renewable energy sources are a more cost-effective option in the long run, as they require initial investment and support for the transition.

Therefore, Option (d) "Renewable energy sources are a more cost-effective option in the long run" is the best inference that can be drawn from the passage.

Option (a) is not correct because it states 'inexpensive'.

Option (b) is not correct because it states will 'never be lower'.

Option (c) is not correct because it extends beyond the scope of the passage.

35. (a)

The tip of the Pentagon is moving 90° clockwise.

This eliminates (b), (c) and (d) options.

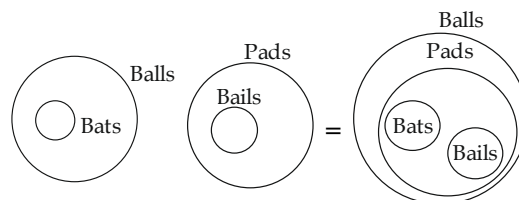
The starting letter of the pair is also moving clockwise.

So, this leaves only (a) as answer.

36. (d)

In such type of syllogism questions, it can be very difficult to check all the four statements. Check for a negative relationship between entities. In the contribution pads and bails are in a negative relationship (not, some not ...) check for the negative relationship in the statements for the same entities.

Applying the above rule leaves (d) as the answer. Verifying (d) using Venn diagram.



**Solutions (37-38):**

Floor	Person	Colour
I	S	Purple
II	P	Magenta
III	R	Blue
IV	Q	Yellow
V	T	Red
VI	V	Pink
VII	U	Green

37. (c)

**Option (c) is correct.**

38. (b)

**Option (b) is correct.**

39. (b)

Probability of getting at most 3 heads

= 1 - probability of getting at least 4 heads

= 1 - [(probability of getting 4 heads) + (probability of getting 5 heads)]

$$= 1 - \left[ {}^5C_4 \left( \frac{1}{32} \right) + \frac{1}{32} \right] = 1 - \frac{6}{32} = \frac{13}{16}$$

40. (d)

Reducing the number to their prime factorial form.

$$21 = 3 \times 7$$

$$35 = 5 \times 7$$

$$x = ?$$



$$\text{LCM} = 315 = 3^2 \times 7 \times 5$$

Since, the LCM contains  $9(3^2)$ ,  $x$  should definitely have  $3^2$  and any or both of 7 and 5.

So the possibilities are

$$3^2 \times 5^0 \times 7^0, 3^2 \times 5^1 \times 7^0, 3^2 \times 5^0 \times 7^1, 3^2 \times 5^1 \times 7^1 = 4$$

41. (c)

Assume the total distance of 120 km

$$\text{Time taken for 40 km/h section} = \frac{30}{40} \text{ hr.}$$

$$\text{Time taken for 30 km/h section} = \frac{40}{30} \text{ hr}$$

$$\text{Time taken for 50 km/h section} = \frac{50}{50} \text{ hr}$$

$$\text{Average speed} = \frac{120}{\frac{3}{4} + \frac{4}{3} + 1} = \frac{120}{\frac{9+16+12}{12}}$$

$$= \frac{120 \times 12}{37} = \frac{1440}{37} \text{ kmph}$$

42. (b)

C A L E N D A R

1 2 3 4 5 6 7 8

There are 4 positions to fix the L and D i.e. (1, 5), (2, 6), (3, 7), (4, 8) and L & D can be interchanged.

The remaining 6 letters can be arranged in  $\frac{6!}{2!}$

ways.

∴ Required number of ways

$$= \frac{6!}{2!} \times 4 \times 2 = 360 \times 8 = 2880.$$

43. (b)

Option (a) is not correct because it states 'will exacerbate'. The passage does not state this.

Option (b) is correct because it states that sustainable consumption patterns like 'shifting towards use of renewable resources' can address challenges like economic inequalities.

Option (c) is not correct because it extends beyond the scope of the passage by stating 'carrying capacity'.

Option (d) is not correct because it extends beyond the scope of the passage for stating 'irreversible causes'.

44. (a)

Option (a) is correct because it is supported by the passage's emphasis on the bottom-up approach to independence, where power is given to the people at the village level.

Option (b) is not correct because it contradicts the passage's assertion that independence must mean the freedom of the people of India, not those in power.

Option (c) is not correct because it goes against the idea of decentralized power in which each village or Panchayat has full powers.

Option (d) is not correct because it extends beyond the scope of the passage for stating 'external support'.

45. (d)

Option (a) is not correct because it goes against the main point of the passage.

Option (b) is not correct because it the passage states exactly the opposite: the impact of on greenhouse gas emissions on mining and transportation is undeniable.

Option (c) is not correct because it goes beyond the scope of the passage. We cannot state if it is replaceable.

Option (d) is correct because decarbonizing steel and cement industries is important due to their significant contribution to greenhouse gas emissions.

46. (a)

**Consider statement I alone:**

Assume N's salary as  $4x$

M's salary =  $3x$

Assume M's expenditure as  $4y$

N's expenditure =  $5y$

We need to find the ratio of  $(3x - 4y)/(4x - 5y)$

Statement I gives us a relationship between  $x$  &  $y$ ; with this we can find the ratio.

**Consider statement II alone:**

Given that  $3x = 3000$  or  $x = 1000$ ; still we don't

have the value of  $y$  or relationship between  $x$  &  $y$ . So the ratio can't be found.

47. (c)

Let  $A$  be the average height of the class and  $N$  be the number of students in the class.

**Consider statement I alone:**

$$AN - 50 = (A - 1)(N - 1)$$

$$\Rightarrow AN - 50 = AN - N - A + 1$$

$$= A + N = 51 \quad \dots(i)$$

Hence, the value of  $A$  cannot be found. So, I alone is not sufficient.

**Consider statement II alone:**

$$AN - 42 = (A + 3)(N - 1)$$

$$\Rightarrow AN - 42 = AN - A + 3N - 3$$

$$= A - 3N = 39 \quad \dots(ii)$$

Hence, the value of  $A$  cannot be found. So, II alone is not sufficient.

Both the statements together provide us with two equations with two variables which can be solved to find average  $A$ . So, answer is (c).

48. (b)

$$P \geq Q < T = R \leq S$$

$$I. \quad S \geq T : \text{True}$$

$$II. \quad R > Q : \text{True}$$

$$III. \quad P \leq S : \text{False}$$

$$IV. \quad Q = S : \text{False}$$

If  $H.C.F$  of two numbers = 18

Both numbers are =  $18a$  &  $18b$

Where  $a$  &  $b$  are co-primes.

$L.C.M$  of such number =  $18ab$

Given that

$$18(a + b + ab) = 954$$

$$(a + b + ab) = 53$$

Adding 1 on both sides

$$1 + a + b + ab = 53 + 1$$

$$(1 + a)(1 + b) = 54$$

Analyzing factors of 54

$$1 \times 54 = (1 + a)(1 + b)$$

$$2 \times 27 = (1 + a)(1 + b)$$

$$3 \times 18 = (1 + a)(1 + b)$$

$$6 \times 9 = (1 + a)(1 + b)$$

The last 3 products give us as  $(a \& b)$  as co-primes

So, 3 pairs are possible

49. (a)

50. (b)

Sum of Number of these pairs

$$2 + 27 + 3 + 18 + 6 + 9 = 65$$

51. (c)

Let the present ages of the Rakesh (father), his only son Vijay (son) and his wife Asha (mother) be  $f$  years,  $s$  years and  $m$  years respectively.

$$\frac{f+s}{2} = \frac{7}{5} \left( \frac{s+m}{2} \right)$$

$$\Rightarrow 5(f+s) = 7(s+m)$$

$$\Rightarrow 5f - 5m = 7s - 5s + 2m$$

$$\Rightarrow 5(f-m) = 2(s+m)$$

$$\text{Given, } (f-m) = 20$$

$$(s+m) = (5 \times 20)/2 = 50$$

$$s+m = 50; m-s = 30$$

$$m = 40$$

$$s = 10; \text{ i.e. Vijay.}$$

52. (b)

Let speed of boat in still water =  $x$

Speed of current =  $y$

Distance =  $d$

$$\text{Then, } \frac{d}{x-y} = \frac{3d}{x+y}$$

$$\Rightarrow x+y = 3(x-y)$$

$$4y = 2x$$

$$\frac{x}{y} = \frac{2}{1} \text{ (required ratio)}$$

53. (c)

Option (a) is incorrect because the passage does not suggest that the use of bracelets will completely eliminate the need for traditional conservation methods such as patrol teams and tracking dogs.

Option (b) is incorrect because while the bracelets can send alerts to wildlife operations centers and anti-poaching teams when an animal is exhibiting abnormal movement patterns, it does not explicitly state that they significantly reduce the impact of poachers.

Option (c) is correct because the passage clearly states that the AI-enabled bracelets



will help conservation teams locate the animals and monitor their behavior in real-time, allowing for a better understanding of their movement patterns.

Option (d) is incorrect because the passage does not provide any information about the accuracy of the bracelets in determining the exact cause of an animal's abnormal movement patterns.

54. (d)

Option A is not correct because it suggests that the complexity of the eye suggests that it has been created by design. This is not in line with the author's views.

Option B is incorrect as it states that natural selection can only lead to simple structures. This is contradicted by the author's later statement that a perfect and complex eye could be formed by natural selection.

Option C is not correct as it 'always' useful to an animal. This is not supported by the passage.

Option D is correct as it suggests that the author eventually came to believe that natural selection could, in fact, lead to the evolution of complex structures like the eye, even though the complexity of the eye initially seemed absurd.

55. (c)

Option (a) is incorrect because it contradicts the statement in the passage that many initial concerns continue to exist.

Option (b) is incorrect because is too absolute and ignores the possibility of other factors that may affect the effectiveness of interventions.

Option (c) is correct because it is supported by the last sentence of the passage which states that the issues with decentralization, such as financial issues, real devolution, and genuine representation of marginalized groups, often depend on the political parties' reluctance to cede power.

Option (d) is incorrect because it is too broad and absolute, as it implies that decentralization is always beneficial regardless of the specific circumstances and implementation.

56. (a)

	A	B	C	D	E	F	G	H	Total wins
A	X	W	W	L	W	L	L	L	3
B	L	X	L	W	W	W	L	L	3
C	L	W	X	W	L	L	L	L	2
D	W	L	L	X	W	L	W	L	3
E	L	L	W	L	X	L	W	L	2
F	W	L	W	W	W	X	L	L	4
G	W	W	W	L	L	W	X	L	4
H	W	W	W	W	W	W	W	X	7

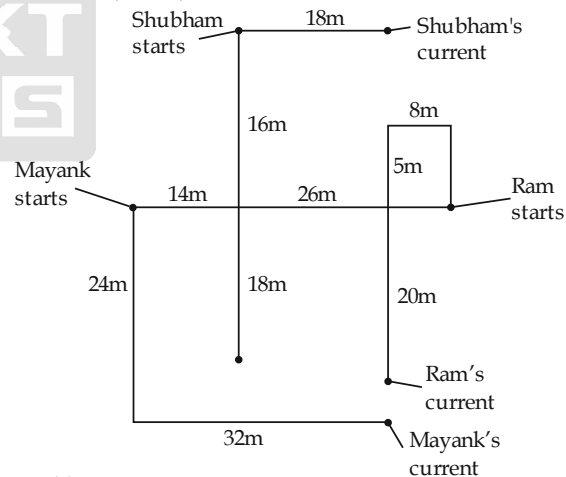
From the table D won against A and E

57. (d)

Because out of the above teams only C won 2 matches while others won three matches.

	A	B	C	D	E	F	G	H	Total wins
A	X	W	W	L	W	L	L	L	3
B	L	X	L	W	W	W	L	L	3
C	L	W	X	W	L	L	L	L	2
D	W	L	L	X	W	L	W	L	3
E	L	L	W	L	X	L	W	L	2
F	W	L	W	W	W	X	L	L	4
G	W	W	W	L	L	W	X	L	4
H	W	W	W	W	W	W	W	X	7

**Solutions (58-59):**



58. (c)

Option (c) is correct.

59. (a)

Option (a) is correct.

60. (c)

Radius of the inner track = 100 m

and time = 2 min 30 sec = 150 sec

Also, radius of the outer track = 102 m

and time = 2 min 32 sec = 152 sec.

Now, speed of A who runs on the inner track

$$= \frac{2\pi(100)}{150} = \frac{20\pi}{15} = 1.33\pi$$

and speed of B who runs on the outer track

$$\frac{2\pi(102)}{152} = 1.342\pi$$

Since, speed of A < speed of B  
Therefore, B runs faster than A.

61. (a)

Let the number of persons in the group be n. As there is a handshake being exchanged between any two persons, there are  ${}^nC_2$  distinct handshakes which are given to be 91.

$$\text{Hence } {}^nC_2 = 91 \text{ i.e., } \frac{n(n-1)}{2} = 91$$

$$n \times (n-1) = 182$$

$$n = 14$$

Further, these 14 persons exchange greeting cards in which each person has to send (n - 1) cards which results in  $14 \times 13 = 182$ .

62. (b)

Present age of Husband and wife

$$= 25 \times 2 + 10 \times 2 = 70 \text{ years}$$

Present age of Husband wife and child

$$= 24 \times 3 = 72 \text{ years}$$

$$\text{Age of a child} = 72 - 70 = 2 \text{ years.}$$

63. (b)

Option (a) is incorrect because it contradicts the passage. It does not state that this proves nuclear power to be an unreliable energy source.

Option (b) is correct because passage suggests that the benefits of nuclear power are seen to outweigh the risks.

Option (c) is not correct because passage does not mention anything about increasing the efficiency of nuclear power.

Option (d) is incorrect because it is too broad and absolute. The passage mentions 'argues' implying that there is no consensus.

64. (b)

**Option (b) is the correct choice.**

Statement (1) is valid as the passage explicitly states that "human-caused climate change is a major reason".

Statement (2) is valid as the passage discusses specifically that more frequent

and abrupt dry spells due to flash droughts could have grave consequences for people in humid.

Statement (3) is an invalid implication as the passage does not provide a comparison of flash drought occurrences between India and the Amazon basin

Statement (4) is valid as the passage directly states this fact.

65. (d)

Option (a) is an invalid inference because the passage does not mention how frequently the RBI uses other tools of inflationary control.

Option (b) is an invalid inference because the passage explicitly states that higher interest rates drag down economic growth.

Option (c) is an invalid inference because the passage does not suggest that the RBI only focuses on controlling inflation and does not consider other factors like employment or economic development.

Option (d) is correct because the passage states that the RBI primarily raises interest rates to control inflation by hitting overall demand to bridge the gap between what is demanded and what is supplied, thus bringing down prices. This implies that the RBI sees controlling demand as a means to control inflation.

66. (b)

$$\text{The population of village A in 2013} = 20 \times 150 = 3000$$

$$\text{The population of village E in 2013} = 4 \times 3000 = 12000$$

Since both the land area and population density increases by 50%

Applying successive percentage formula, we get

$$50\% + 50\% + \frac{(50)(50)}{100}\% = 125\%$$

Population of E in 2023

$$= \left( \frac{100+125}{100} \right) \times 12,000$$

$$= \frac{9}{4} \times 12000 = 27000$$

67. (b)

Number of people in village D  
= Population density  $\times$  Land area =  $12 \times 150 = 1800$

Number of males = 400

Number of females =  $1800 - 400 = 1400$

Female gender ratio =  $\frac{1400}{400} = 3.5$

68. (c)

Total population of A =  $20 \times 50 = 3000$

Total population of D =  $12 \times 150 = 1800$

Total population of C =  $8 \times 250 = 2000$

Number of females in A and C =  $\frac{2}{3}(1800)$   
= 1200

Male gender ratio of A =  $\frac{3000 - 1200}{1200}$

=  $\frac{1800}{1200} = \frac{3}{2} = 1.5$

Male gender ratio of C =  $\frac{2000 - 1200}{1200} = \frac{2}{3}$

Percentage =  $\frac{A - C}{C}$

=  $\frac{\frac{3}{2} - \frac{2}{3}}{\frac{2}{3}} = 125\%$

69. (a)

Assume total number of students = 100

$\Rightarrow$  No. of boys =  $\frac{40}{100} \times 100 = 40$

$\Rightarrow$  No. of girls =  $100 - 40 = 60$

$\Rightarrow$  No. of students who scored more than

40 marks =  $\frac{60}{100} \times 100 = 60$

$\Rightarrow$  No. of girls who scored more than 40 marks (75%) =  $\frac{3}{4} \times 60 = 45$

$\Rightarrow$  No. of boys who scored more than 40 marks =  $60 - 45 = 15$

$\Rightarrow$  percentage of boys who scored less than 40 marks

=  $\frac{40 - 15}{40} \times 100\% = 62.5\%$

70. (a)

By using the observation that average of two numbers lies between the two numbers. We can derive the following:

NIT Bhopal > NIT Patna > NIT Trichy > NIT Jaipur > NIT Allahabad > NIT Delhi.

71. (d)

By using the observation that average of two numbers lies between the two numbers. We can derive the following:

NIT Bhopal > NIT Patna > NIT Trichy > NIT Jaipur > NIT Allahabad > NIT Delhi.

72. (d)

Since, manufacturing expenses is proportional to number of machines

$30,000 = K_M \cdot 12$  ( $K_M$  = constant = 2500)

Annual output  $\propto$  No. of machines

$54,000 = K_o \cdot 12$

$K_o$  = Const. = 4500

$\Rightarrow$  Reduction in number of machines =

$16.66\% = \frac{2}{12} \times 12 = 2$

$\Rightarrow$  No. of machines = 10

**For the case of 10 machines:**

Manufacturing expenses =  $10 \times K_M = 25,000$

Establishment charges = 10,000

Annual output =  $10 \times K_o = 45,000$

Profit in case of 12 machines

=  $54,000 - (30,000 + 10,000) = 14,000$

Profit in case of 10 machines

=  $45,000 - (25,000 + 10,000) = 10,000$

Reduction in shareholder amount

=  $\frac{14,000 - 10,000}{14,000} = 28.57\%$

73. (c)

Manufacturing expenses =  $15 \times 2500 = 37,500$

Establishment charges =  $1.2 \times 10,000 = 12,000$

Annual output =  $15 \times 4500 = 67,500$

$\Rightarrow$  Profit = Revenue [Output - expenses]

=  $67,500 - [37,500 + 12,000] = 18,000$

Shareholder income =  $\frac{1}{4} \times 18,000 = 4,500$

74. (b)

53 Sundays is possible only when starting days Sunday or Saturday.

**Case (i):** When year start with Sunday then next 3 years will always have 52 Sundays hence total number of Sundays are  $53 + 3 \times 52 = 209$  Sundays

**Case (ii):** When year start with Saturday and then we have 53 Sundays that means that year is a leap year, then next 3 years will always have 52 Sundays hence total number of Sundays are  $53 + 3 \times 52 = 209$  Sundays.

75. (b)

$$\frac{8400 \times R \times 2}{100} + \frac{9600 \times (R+5) \times 2}{100} = 6360$$

$$168R + 192R + 960 = 6360$$

$$360R = 5400 ; R = 15\%$$

$$\text{Simple interest} = \left( \frac{p \times t \times r}{100} \right)$$

Since  $r = 15\%$ ,  $t = 3$  years and  $p = 10000$

$$\therefore \text{Simple interest} = \left( \frac{10,000 \times 15 \times 3}{100} \right) = 4500$$

76. (b)

Rs.  $(8400 + P)$  invested at  $15\%$  & Rs.  $(9600 + P)$  invested at  $20\%$

Equivalent CI of two years at the rate of  $15\%$

$$= 15 + 15 + \frac{15 \times 15}{100} = 32.25\%$$

Equivalent CI of two years at the rate of  $20\%$

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

From the question,

$$(8400 + P) \times \frac{32.25}{100} + (9600 + P) \times \frac{44}{100} = 8153$$

$$270900 + 32.25P + 422400 + 44P = 815300$$

$$76.25P = 122000$$

$$P = \text{Rs. } 1600$$

77. (d)

The series given has 7 as base 4 all power of 7 show a cyclicity of 4.

$$7^1 = 7$$

$$7^2 = 49$$

$$7^3 = 43$$

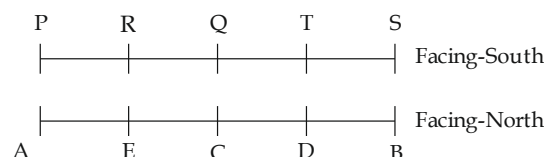
$$7^4 = 01$$

$$7^0 + [\text{Powers 1 to 4}] + [\text{Powers 5 to 8}] +$$

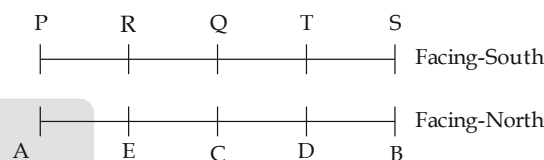
$$[\text{Powers 9 to 12}] + [\text{Powers 13 to 16}] = 01$$

$$7^0 + [00] + [00] + [00] + [00] = 01$$

78. (b)



79. (d)



80. (b)

Let the original sequence be TIMRL Two fingers can be out of place. This can be done if and only if two fingers interchange their position. These two can be selected in  ${}^5C_2 = 10$  ways. In addition to these, the original sequence will also be accepted. Hence the total number of acceptable sequences =  $10 + 1 = 11$ .

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