ANSWERS & EXPLANATION

APTITUDE TEST–Test (4295) – 2024

1 (c)

$C_1 \rightarrow$ $\quad\quad\quad\quad\quad\quad\quad\quad$ $\leftarrow C_2$

$A \rightarrow 1 \rightarrow P \rightarrow\rightarrow\rightarrow\rightarrow 4 \rightarrow\rightarrow\rightarrow\rightarrow B$

Let Car C_1 took "t" hours to reach at point P. Then Car C_2 will take "t+2" hours to reach point P.
If AP = d km, then BP = 4d km
It is given that speed of C_2 is 80% ($4/5^{th}$) that of C_1. So, if speed of Car C_1 is d/t km/hr, then speed of Car C_2 would be 4d/5t km/hr.
So, d/(d/t) + 2 = 4d/(4d/5t)
Or t + 2 = 5t
Ot t = 2/4 = ½ hour = 30 minutes
So, option (c) is the correct answer.

2 (a)

Total employees (i.e. Sample space), n(S) = 340
Total graduate employees = 85
Now, total employees who are not graduate, n(E) = 340 – 85 = 255
So, probability of selecting an employee who is not a graduate, P(not graduate) = n(E)/n(S) = 255/340 = 0.75
Hence, option (a) is the right answer.

3 (c)

In a correct clock, the minute hand gains 55 minute spaces over the hour hand in 60 minutes.
To be together again, the minute hand must gain 60 minutes over the hour hand.
Since, 55 minutes are gained in 60 minutes.
So, 1 minute is gained in 60/55 minutes.
So, 60 minutes are gained in 60/55 × 60 = 720/11 minutes.
So, in a correct clock, the hands of a clock coincide every 720/11 minutes.
But in this case, they are together again after 64 minutes, hence the clock must be gaining time.
So, the gain in 64 minutes = 720/11 – 64 = 16/11 min.
So, the gain in 1 min. =16/(11×64) min.
∴ The gain in one day (24×60 min.) = 16/(11×64)×24×60 = 360/11 min. = 360/11 min.
So, option (c) is the correct answer.

4 (c)

Note: The question is about invalid assumptions.
Assumption 1 is incorrect: The given assumption is not correct as it is not based on the passage. The passage does not discuss the common habits of successful people. The passage only mentions habits and their importance in daily tasks. Furthermore, it would be incorrect to say that the successful people have common habits. So, this assumption is not correct.
Assumption 2 is incorrect: The passage nowhere mentions that all daily habits have an equal impact on the completion of daily tasks. The passage only covers habits and their role in daily life.

5 (c)

Option (a) is incorrect: The given option is not correct because the passage does not discuss small or big habits. It's just talking about habits in general.

Option (b) is incorrect: This option focuses on choosing the right career habits for achieving professional goals. But, the passage is about the relevance of daily habits for enhancing quality of life in general, not confined to career goals only. This answer option significantly narrows down the scope of the passage. Hence, this is not the most rational inference.

Option (c) is correct: Consider the lines "***Habits serve as the silent architects of a streamlined and efficient life**, making the **complex tasks of daily living more manageable** … Whether it's the automatic sequence of a morning routine or the disciplined approach to work, **habits contribute to time management and overall well-being**."* These lines show that habits improve the quality of life. Hence, this is the most rational inference.

Option (d) is incorrect: The passage is about the significance of habits in daily life and routines. However, the option makes a comparative analysis of shunning bad habits and fostering new ones, which is not indicated in the passage. So, this is not the most rational inference of the passage.

6 (b)

Option (a) is incorrect: The context of polar bears being shifted to other oceans is not a part of the passage. The passage is about climate change and its impact on polar bears. So, this option is beyond the scope of the passage.

Option (b) is correct: The passage conveys that climate change has impacted polar bears and even threatened their survival. So, any policy for the Arctic Ocean must keep polar bears in focus. The lines "***Conservation efforts, sustainable policies,** and international cooperation are imperative to mitigate the melting of Arctic ice, safeguard the unique ecosystem, and **ensure the survival of polar bears, emblematic creatures of the Arctic facing an uncertain future** in the wake of climate-induced transformations"* also carry the same essence. So, this is the most logical inference from the passage.

Option (c) is incorrect: The passage does not mention reversing climate change as the 'only' way to protect polar bears. It only mentions mitigation of climate change for the survival of polar bears in the lines "*Conservation efforts, sustainable policies, and international cooperation are imperative **to mitigate the melting of Arctic ice, safeguard the unique ecosystem, and ensure the survival of polar bears,** emblematic creatures of the Arctic facing an uncertain future in the wake of climate-induced transformations."* Hence, this option is beyond the scope of the passage.

Option (d) is incorrect: The passage is about polar bears and the impact of climate change on them. The passage does not mention that polar bears are keystone species. Therefore, this option is not correct.

7 (a)

Option (a) is correct: The option captures the main theme of the passage, which is the role of political maturity in strengthening democracy. It is visible in the lines "*Democracy, a cornerstone of political systems, thrives when **accompanied by political maturity among citizens** … **Political maturity acts as a stabilizing force**, fostering constructive dialogue and conflict resolution, **ensuring that democratic ideals withstand** internal tensions and external pressures, and allowing nations to navigate challenges."* These lines reflect that political maturity plays an important role in strengthening democracy. Hence, this is the correct and best answer.

Option (b) is incorrect: The option is not correct because it states that a mature democracy consists of a "biologically mature population" instead of saying a "politically mature population". The central theme of the passage focusses upon the role of political maturity in making democracy stronger. So, this option is not the correct answer.

Option (c) is incorrect: Refer to the lines "*Striking a balance between individual rights and collective responsibility becomes paramount for the **sustenance of a robust democracy**."* The author clearly talks about balancing individual rights and collective responsibility. A democracy might become chaotic if there is no balance between individual rights and collective responsibility. Hence, this option is not the correct answer.

Option (d) is incorrect: The central theme of the passage is political maturity and its significance for strengthening democracy. However, the option talks about the elements of democracy, which is neither the main idea of the passage, nor is covered in the passage per se. Hence, this answer option is incorrect.

8 (d)

I) $2a^2 – 3a – 44 = 0$
Or $2a^2 + 8a – 11a – 44 = 0$
Or $2a (a + 4) – 11 (a + 4) = 0$
Or $(2a – 11) (a + 4) = 0$
Or $a = 11/2, -4 = 5.5, -4$
II) $3b^2 – 20b + 25 = 0$
Or $3b^2 – 15b – 5b + 25 = 0$
Or $3b (b – 5) – 5 (b – 5) = 0$
Or $(3b – 5) (b – 5) = 0$
Or $b = 5/3, 5 = 1.66, 5$
Hence, option (d) is the correct answer.

9 (b)

Total number of biscuits in a packet = 4 x 15 = 60
Total number of broken biscuits in a packet = 5% of 60 = 3
Total number of broken biscuits in the carton = 3 x 50 = 150
Hence, option (b) is the right answer.

10 (c)

Let the ages of Geeta and Sita be G and S respectively.
40% = 2/5
According to the question,
$(1/5) (G + S) = (2/5) (S - G)$
Or $(G + S) = 2 (S - G)$
Or $S = 3G$
∴ Required percentage = $(G/S) \times 100 = (G/3G) \times 100 = 33.33\%$
Hence, option (c) is the correct answer.

11 (b)

Number of odd days in 9999 = Remainder [9999/7] = 3
If 1st January 2024 is Monday, then 9999 days from now will be Monday + 3, i.e. Thursday.
Hence, option (b) is correct.

12 (b)

The value of a car is depreciating by 12.5% every year.
We know that, $A = P [1 – (R/100)]^t$
Where, A = Final amount; P = Initial amount = 540000; R = rate of depreciation = 12.5%; time, t = 4
∴ $A = P (1 – 125/1000)^4$
Or $A = 540000(7/8)^4$
Or $A = 316538.086$
So, the price of the car in the year 2025 will be Rs. 316538.
Hence, option (b) is the right answer.

13 (a)

We have to find the number of internal cubes, i.e. the number of cubes that are not exposed.
There are 512 cubes. Now, $8^3 = 512$. So, n = 8
Number of internal cubes = $(n - 2)^3 = (8 - 2)^3 = 6^3 = 216$
Hence, option (a) is correct.

14 (b)

Let MNOPQR be a six-digit telephone number.
Given that the first two digits of each number are 5 and 4.
Therefore, the telephone number is 54OPQR.
As repetition is not allowed and 5 and 4 are already taken, the digits available for place O are 0, 1, 2, 3, 6, 7, 8, 9, i.e. eight possible digits.
Thereafter, the number of digits that can come at place P is 7.

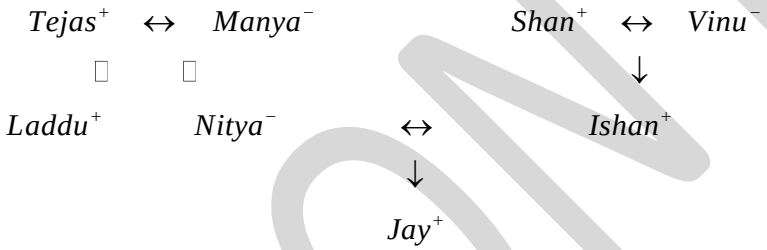
Similarly, at Q, the number of possible digits is 6.
Similarly, at R, the number of possible digits is 5.
Therefore, the number of such 6-digit telephone numbers = 8 × 7 × 6 × 5 = 1680
Hence, option (b) is the right answer.

15 (b)

On observing the graph, we can say that death of children due to lack of vaccination from 1990 to 2005 has decreased from 5 million to 1 million, and the death of children due to diseases from 1990 to 2005 has increased from 3 million to 4.5 million. Hence, statement in option (a) is correct.
The total number of deaths of children due to malnutrition in year 1990 is 4 million, which is not equal to the total number of deaths of children due to diseases in 2005 which is 4.5 million. Hence, statement in option (b) is not correct.
Total number of deaths of children due to diseases from 1990 to 2005 is 15 million (i.e. 3 + 3.5 + 4 + 4.5 = 15), which is more than total number of deaths of children due to malnutrition from 1990 to 2005 which is 9 million (i.e. 4 + 2.5 + 2 + 0.5 = 9). Hence, statement in option (c) is correct.
The number of deaths of children in year 1990 = 5 + 4 + 3 = 12 million
The number of deaths of children in year 2005 = 1 + 0.5 + 4.5 = 6 million (i.e. half of 12 million)
Hence, statement in option (d) is correct.
Hence option (b) is the right answer.

16 (a)

Family diagram:



So, Ishan is the spouse of Nitya.
Hence, option (a) is the correct answer.

17 (a)

18 (a)

The given word is ABIOGENETICALLY.
On arranging its letters alphabetically in reverse order, we get: "YTONLLIIGEECBAA"
Now, let's compare the two to identify the letters with unchanged positions.

A B I O G E N E T I C A L L Y

Y T O N L L I I G E E C B A A

We find that no letter has stayed in the same position.
Hence, option (a) is correct.

19 (d)

Option (a) is incorrect: The main theme of the passage is how social influence affects governance and vice versa, not why one must have a strong social influence.
Option (b) is incorrect: Saying that governance without social influence would be meaningless is hypothetical. Moreover, it only covers one aspect of the passage, which is how social influence affects governance, and misses the second aspect of governance affecting social influence. Hence, this is not the best inference.
Option (c) is incorrect: The given option seems to be correct as it partially covers the context of the passage. "How social influence affects governance" is covered, but it misses how governance impacts social influence. So, this option is not the most logical inference.

Option (d) is correct: The passage covers the effect of social influence on governance and vice versa. It can be seen in the lines "*The advent of social media has amplified the speed and* ***reach of social influence, enabling citizens to voice their concerns*** *and* ***mobilize movements****."* and "*Effective governance requires responsiveness to public sentiment and the ability to positively navigate and channel social influence."* Based on these lines we can infer that governance shapes societal influence, and societal influence also moulds the nature of governance.

20 (d)

Assumption 1 is incorrect: The passage nowhere mentions the sustainability of leisure, especially whether or not it is natural. In fact, the passage mentions that sustained leisure can be achieved after addressing the challenges in the integration of machines into leisure. So, this assumption is contradictory to the information contained in the passage and hence is not correct.

Assumption 2 is incorrect: The passage does not discuss "the development of" technology per se. Sustained leisure will depend not on technology but on addressing the challenges in the integration of machines into leisure. So, this assumption is not correct because it is beyond the scope of the passage.

21 (b)

Option (a) is incorrect: "*Two sides of the same coin*", suggests that the two aspects are inseparable or inherently linked, much like the two sides of an actual coin that cannot exist independently. Here, in the given passage, leisure and machines are connected, but they can exist independently as well. So, this option does not best reflect the crux.

Option (b) is correct: The given option is correct because of the lines "*Achieving a harmonious integration of machines into leisure* ***necessitates addressing the multifaceted challenges*** *to ensure a balanced, inclusive, and sustainable leisure landscape for all."* The whole passage mentions the multifaceted challenges like "***Ethical considerations surface*** *with data privacy issues … affecting mental well-being****. Environmental sustainability*** *… to growing e-waste concerns."* These challenges must be addressed to fulfil machine-based leisure. So, we can say that machine-based leisure is incomplete without addressing its challenges.

Option (c) is incorrect: The passage does not discuss the evolution of leisure. Rather, it discusses the challenges related to the infusion of machines into leisure activities. So, this option can be ruled out as incorrect.

Option (d) is incorrect: The passage has not touched upon the future of leisure from technology or machines. So, to infer that the future of leisure from machines would be detrimental would not be correct, as it is not based on any information contained in the passage. Hence, this option is not correct.

22 (b)

Let 5 kg of coffee be mixed with 2 kg of chicory.
C.P. of the mixture = Rs. (5 × a + 2 × b) = Rs. (5a + 2b)
S.P. of the mixture = (5 + 2) c = Rs. 7c
Since the seller registers a gain, therefore S.P. > C.P.
Gain/Profit = S.P. – C.P. = 7c – (5a + 2b) = Rs. (7c – 5a – 2b)
Hence, option (b) is the correct answer.

23 (a)

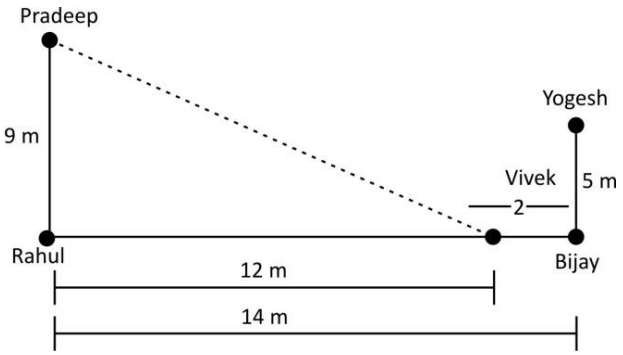
Based on the information provided in the question, we get:

S. No.	Book
1.	Bengali
2.	Manipuri
3.	Bhojpuri
4.	English
5.	Punjabi
6.	Tamil
7.	Hindi

So, option (a) is the correct answer.

24 (d)

Distance between Rahul and Bijay is 2 less than the square of 4, i.e. $4^2 - 2 = 14$ m
Based on the information provided in the question, we get:



The minimum distance needed to be covered by Pradeep to reach Vivek = $\sqrt{(12^2 + 9^2)} = \sqrt{(144 + 81)} = 15$ m
So, option (d) is the correct answer.

25 (c)

There are 21 consonants.
Therefore, the possible number of motor vehicle registration number plates that can be formed for the state of West Bengal = 7 x 6 x 21 (consonants) x 5 x 4 x 3 x 2 = 105840.
Hence, option (c) is the right answer.

26 (c)

Let the cost price of one meter cloth be Rs. x.
So, marked price of one meter cloth = Rs. 1.45x.
And, selling price of one meter cloth = 1.45x (70/100) = 1.015x
Now, due to the increase in the length of scale, the cost price of cloth (which the merchant thinks to be one meter, but is actually 1.05 m) will be Rs. 1.05x.
So, loss = 1.05x – 1.015x = 0.035x
Loss percentage = (0.035x/1.05x) x 100 = 3.33%
Hence, option (c) is the right answer.

Explanation for Questions 27 to 29:

After insertion of the cards in the envelopes, it was found that two envelopes of red color were used by the houses B and D. We can represent it as follows:

House	Card 1	Card 2	Card 3
A			
B	Red	Red	
C			
D	Red	Red	
E			

Now, red envelopes were chosen by the houses B, D and E. Therefore, the fifth red envelope has to be used by house E.
Further, besides red, house B prefers yellow envelope only. So, third card of House B is inserted in yellow envelope.
Besides red, house D prefers brown envelope. So, the third card of house D has to go in brown envelope.
Filling this information in the table we get:

House	Card 1	Card 2	Card 3
A			
B	Red	Red	Yellow
C			
D	Red	Red	Brown
E	Red		

House E prefers red and brown. Therefore, the remaining 2 cards of house E have to go in brown envelopes.
House A likes only yellow envelopes. So, all the three cards of House A will go in yellow envelopes.

House	Card 1	Card 2	Card 3
A	Yellow	Yellow	Yellow
B	Red	Red	Yellow
C			
D	Red	Red	Brown
E	Red	Brown	Brown

House C has to use the remaining one yellow and two brown envelopes. Hence, we get:

House	Card 1	Card 2	Card 3
A	Yellow	Yellow	Yellow
B	Red	Red	Yellow
C	Yellow	Brown	Brown
D	Red	Red	Brown
E	Red	Brown	Brown

27 (a)

As seen in the table above, House A uses all the three envelopes of the same color.
Hence, option (a) is the correct answer.

28 (d)

As we can read from the table, envelopes of all the colors were used by exactly three houses.
So, option (d) is the correct answer.

29 (c)

From the table we can see that brown envelopes were used by houses C, D and E.
Hence, option (c) is the correct answer.

30 (b)

The average age of the people whose ages are below 31 years will be maximum if the average age of the people aged 31 years and above is minimum. So, let's assume that there are 60 people having the same age of 31 years.
Let x be the maximum possible average age of the people whose ages are below 31 years.
So, $(31\times60 + 30x)/(60 + 30) = 26$
Or $1860 + 30x = 26\times90$
Or $30x = 2340 – 1860$
Or $30x = 480$
Or $x = 16$
So, option (b) is the correct answer.

31 (a)

Option (a) is correct: The given option best summarizes the whole theme of the passage which is the crucial issue of diminishing resources caused by climate change and the attention it needs in the form of international cooperation and sustainable solutions. The lines, *"**Climate-induced resource scarcity**, ... **Sustainable resource management, renewable energy adoption, international cooperation are crucial to mitigate climate change and alleviate resource-driven conflicts**, fostering a resilient and **equitable global response to the complex interplay between diminishing resources and the escalating climate crisis**"* validate the given option. Hence, this is the best crux of the passage.
Option (b) is incorrect: The given option is vague. The passage talks about diminishing resources and how it is connected to climate change, but this option only talks about solutions to climate change. So, this option does not capture the central theme or context of the passage in its entirety.
Option (c) is incorrect: The passage does not cover the context of human survival due to diminishing resources caused by climate change. So, this option is beyond the scope of the passage and is not correct.

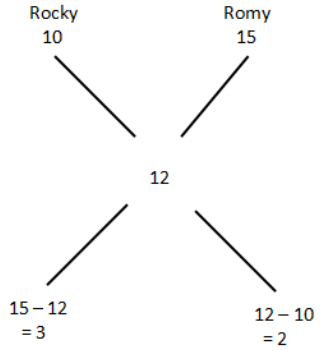
Option (d) is incorrect: The given option seems correct. However, it only partially covers the theme of the passage. It only mentions the issue and misses the solution suggested in the passage regarding sustainable resource management and global cooperation. So, this option is not the best crux of the passage.

32 (b)

Option (a) is incorrect: The passage nowhere specifies or mentions about the responsibilities of technology platforms, content creators and consumers separately. Hence, this is not the correct inference.
Option (b) is correct: The given option is based on the lines: "***Technological ethics should guide the development and implementation of tools and policies that promote transparency***, *fact-checking, and responsible information sharing, fostering an ethical digital landscape that prioritizes truth and integrity."* These lines show that technological ethics are critical for handling fake news because ethics promote transparency, truth and integrity. Hence, this option is correct.
Option (c) is incorrect: The passage does not mention anything about a surveillance system. Moreover, this option misses out the main theme of the passage, which is technological ethics. Hence, this is not the correct inference.
Option (d) is incorrect: Though true, this statement misses out the main theme of the passage, which is technological ethics. Fake news is an important aspect covered in the passage, but so is technological ethics.

33 (b)

Total amount lent = 20000
Total interest after 5 years = 32000 – 20000 = Rs. 12000
Simple interest (SI) = $(P \times R \times T)/100$
or $12000 = (20000 \times R \times 5)/100$
or $R = (12000 \times 100)/(20000 \times 5)$
or R = 12%
Hence, we get:



∴ The ratio of shares of money lent to Rocky and Romy = 3 : 2
Threfore, money lent to Romy = (2/5) × 20000 = Rs. 8000
So, option (b) is the correct answer.

34 (d)

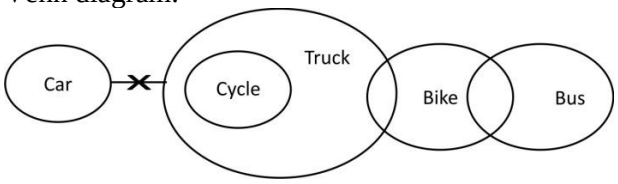
(a) C > B ≥ D = A < G; here, A < B is possibly true.
(b) C > D ≥ A = G < B; here A < B is definitely true.
(c) B > D ≥ G = A < C; here A < B is definitely true.
(d) G > D ≥ B = C < A; here A < B is definitely false.
So, option (d) is the correct answer.

35 (c)

The pattern is: I x III - 2^3 = II
(a) 9 ☺ 37 ☺ 5 = 9 x 5 - 2^3 = 37
(b) 11 ☺ 135 ☺ 13 = 11 x 13 - 2^3 = 135
(c) 3 ☺ 15 ☺ 7 = = 3 x 7 - 6 = 15
(d) 45 ☺ 757 ☺ 17 = = 45 x 17 - 2^3 = 757
Hence, option (c) is correct.

36 (c)

Venn diagram:



Hence option (c) is the right answer.

Explanation for Questions 37 to 39:

The floor number of E is an even number, and its building letter is a vowel. G lives to the west of B in the same numbered flat, but below the flat of E. B and C are not in the same building, and they live either on the topmost floor or on the bottommost floor. On considering these conditions, we get:

	Case 1		Case 2	
Floors	**Building O**	**Building P**	**Building O**	**Building P**
5	C		C	
4			E	
3				
2	E			
1	G	B	G	B

The difference between the floor numbers of C and J is 3. A and C live in the same building, and the letter of their building is a vowel. J lives to the southeast of C. A and J are not in the same building. A lives on an odd numbered floor but below C. On considering these conditions, we get:

	Case 1		Case 2	
Floors	**Building O**	**Building P**	**Building O**	**Building P**
5	C		C	
4			E	
3	A		A	
2	E	J		J
1	G	B	G	B

Now, I and D are not in the same building. The building letter of I is a vowel and he lives on the fourth floor. H lives below F, with D living between them. So, Case 2 gets eliminated.

	Case 1	
Floors	**Building O**	**Building P**
5	C	F
4	I	D
3	A	H
2	E	J
1	G	B

37 (b)

38 (a)

39 (c)

40 (a)

30% of the work is done by A alone. It means A did 3/10 unit of work alone.
33.33% of the work is done by B alone. It means B did 1/3 unit of work alone.
Portion of work done by A and B together in 2 days = [1 – {(3/10) + (1/3)}
= 1 – (19/30) = 11/30
So, the portion of work done by A and B together in 1 day = 11/60
It is given that B takes 20% more time than A. Let A completes a work in x days. Then B will complete the same work in 1.2x days.

So, (1/x) + (1/1.2x) = 11/60
Or (1/x) + (5/6x) = 11/60
Or (11/6x) = 11/60
Or x = 10 days
B can complete the work in 1.2x days, i.e. 1.2 × 10 = 12 days
So, option (a) is the correct answer.

41 (c)

Given: Total overs in 1 inning = 20
Required run rate initially = 10.5/over
∴ Total runs to chase = 20 × 10.5 = 210
Now, Run rate at the end of 14^{th} over = 11.5
∴ Total runs at the end of 14^{th} over = 11.5 × 14 = 161
∴ Runs still required by India to win the match = 210 – 161 = 49 runs
Hence, option (c) is correct.

42 (c)

Let gross salary of Himanshu be 100 units.
Net salary (or in-hand salary) = 100 – 20 = 80 units.
Himanshu spends 25% of his in-hand salary on fooding and lodging, 20% of the remaining on education and transportation, and 10% of the remaining on entertainment.
So, amount left with him = 80 x (75/100) x (80/100) x (90/100) = 43.2 units.
Now, 43.2 units = 15600
Or 100 units = (15600/43.2) x 100 = 36111.11 (approx.)
Monthly contribution toward NPS = 10 units = 361.11 × 10 = Rs. 3,611.11
Amount spent on entertainment = 4.8 units = 4.8 × 361.11 = Rs. 1733.33
Hence, option (c) is the right answer.

43 (d)

Let marked prices of Sandeep, Pawan, and Raghav be ₹ 200, ₹ 300, and ₹ 400 respectively.
Selling price of Sandeep after 25% discount = 200 × (100 – 25)/100 = Rs. 150
Selling price of Pawan after giving two successive discounts of 20% and 10% = 300 × {(80/100) × (90/100)} = Rs. 216
Selling price of Raghav after giving 56% discount = 400 × {(100 – 56)/100} = Rs. 176
∴ Descending order of their selling prices is Pawan > Raghav > Sandeep.
Hence, option (d) is the correct answer.

44 (d)

According to the question,
a < b and c < b
If we assume value of b to be 8, then a and c can be any digit between 1 and 7.
So, the total number of such numbers = 7 × 7 = 49
If we assume value of b to be 7, then a and c can be any digit between 1 and 6.
So, the total number of such numbers = 6 × 6 = 36
…..and so on.
So, the total number of such numbers = 49 + 36 + 25 + 16 + 9 + 4 + 1 = 140
Hence, option (d) is the correct answer.

45 (c)

Last date of the February month of the year 1896 = 29 (1896 is a leap year)
Number of years in his entire married life = 1963 – 1896 = 67
Number of leap years in his entire married life = Quotient [67/4] = 16
So, he will celebrate 16 marriage anniversaries in his entire life.
Hence, option (c) is the correct answer.

46 (a)

From statements 1 and 2, time taken by both friends to travel both ways by train = 15 – 3 = 12 hrs.
So, time taken to travel one way by train = 12/2 = 6 hrs
Hence, time taken to travel one way by car = 6 + 3 = 9 hrs
So, time required to travel bothways by a car = 9 × 2 = 18 hrs.
Hence, option (a) is the correct answer.

47 (a)

Note: The question is about invalid assumptions.
Assumption 1 is incorrect: The given statement is not correct because it is an extreme one. The passage does not imply that it is not possible to live a simple life. The line "*In an era dominated by technology, the **pursuit of a simple life is both elusive and challenging (but not impossible)**".* So, this is an incorrect assumption.
Assumption 2 is correct: The given assumption is based on the lines "***Simplicity** in the digital age involves mindful tech use, **fostering genuine human connections**, ... **benefits of technology without succumbing to the overwhelming complexities** it can introduce in the quest for a simpler life."* Hence, this assumption is correct.

48 (d)

Inference 1 is incorrect: The passage nowhere mentions that issues or violations of the moral code are happening because of the lack of legal sanctity. The passage is about enforcement and its effectiveness. Also, whether effectiveness will increase by making it legal has not been discussed in the passage. Hence, this inference is not correct.
Inference 2 is incorrect: The passage does not state that moral code is regularly violated, or that this situation is worsening day by day. Moreover, the passage talks about political ethics in the parties and not the rule of law. Rule of law is different from moral code. So, this inference is not correct.

49 (b)

Assumption 1 is incorrect: The given assumption is not correct because the passage does not trace the cause of the replacement of cuddling with phones. Therefore, to assume that parents are busy and that is why they have replaced cuddling with phones would not be correct.
Assumption 2 is correct: The given assumption is based on the following lines "*This shift might contribute to a generation with diminished abilities to **connect emotionally, understand social nuances**, and navigate complex relationships.*" This shows that if cuddling does not happen properly, it may affect a person emotionally as well as socially. Hence, it is crucial for emotional as well as social intelligence.

50 (a)

Let the number of balls be 'n'.
As the boy covers 364 m, he covers 364/2 = 182 m on the one side and 182 m on the other side.
First consider the distance covered on one side:
As the balls are placed in the lawn at intervals of 1 m in a straight line, so the total distance covered by him = 2 + (2+2) + (2+2+2) + (2+2+2+2) + ……. = 2 + 4 + 6 + 8 + …… = n/2[2×2 + (n – 1) 2] = n(n+1)
[Sum of 'n' terms in A.P. (arithmetic progression), $S_n = n/2[2a + (n – 1) d]$,
where, n = number of terms, a = first term and d = common difference].
Here n is the number of balls or number of terms in the A.P.
So, n(n+1) = 182 = 13×14
∴ n = 13.
Hence, the total number of balls = 13 + 13 + 1 = 27.
Hence, option (a) is the correct answer.

51 (d)

$N = 3^6 \times 5^5 \times 2^6 \times 15^7 = 3^6 \times 5^5 \times 2^6 \times 3^7 \times 5^7 = 3^{13} \times 5^{12} \times 2^6$
So, total number of factors = (13 + 1) × (12 + 1) × (6 + 1) = 14 × 13 × 7
Any odd factor will have to be a combination of 3 and 5.
Total number of odd factors of $3^{13} \times 5^{12}$ = (13 + 1) × (12 + 1) = 14 × 13

Total number of even factors = Total number of factors – Total number of odd factors = (14 × 13 × 7) – (14 × 13) = 1092
Hence, option (d) is the correct answer.

52 (b)

Let the first digit be n.
Third digit is equal to first digit. So, it will also be n.
Second digit = Sum of first and third digits = n + n = 2n
Fifth digit = Sum of third and second digits = n + 2n = 3n
Sixth digit = Sum of third and fifth digits = n + 3n = 4n
Fourth digit = Sum of fifth and sixth digits = 3n + 4n = 7n
Ratio of fifth and fourth digit = 3n : 7n = 3 : 7
Hence, option (b) is the correct answer.

53 (d)

Let a, b, c, d, e, f, g, h and i be the ages, in years, of the persons, listed from youngest to oldest. From the given information it follows that e = 70 and i = 3a + 30.
Therefore, listed from youngest to oldest, the ages are a, b, c, d, 70, f, g, h and 3a + 30.
The maximum value of 3a + 30 will occur when the maximum value of a is used, and this will be the case only if the youngest 4 persons all have the same age. Therefore, listed from youngest to oldest, the ages are a, a, a, a, 70, f, g, h and 3a + 30.
The maximum value for a and by extension 3a + 30 will occur when f, g and h are as small as possible. Since f, g and h are to the right of the median, they must be at least 70 and so 70 is the least possible value for each of f, g and h. Therefore, listed from youngest to oldest, the ages are a, a, a, a, 70, 70, 70, 70 and 3a + 30. Since the average age is 50, we get:
(a+a+a+a+70+70+70+70+(3a+30))/9 = 50
or, a = 20.
Hence, the maximum possible age of the oldest person = 3a + 30 = 3×20 + 30 = 90 years.
Hence, option (d) is the correct answer.

54 (b)

HCF of 160, 224, 96, 128, 192 and 64 = 32
So, minimum number of buses required = (160 + 224 + 96 + 128 + 192 + 64)/32 = 864/32 = 27
Hence, option (b) is the correct answer.

55 (a)

For the first strip, we have 7 colour options - say VIBGYOR.
For the second strip, we need to choose a colour different from the first strip. So, we have 6 colour options. - say IBGYOR.
For the third strip, we need to choose a colour different from the second strip. So, we have 6 colour options. - say VBGYOR.
….and so on.
So, the total number of possible ways to design the flag = 7 x 6 x 6 x 6 x 6 x 6 x 6 = 326592
Hence, option (a) is correct.

56 (c)

	Mona		Shubhra		Divyadharsini	
Ratio of capitals =	1/3	:	1/4	:	1/5	
=	1/3 ×60	:	1/4 ×60	:	1/5 ×60	[LCM (3,4,5) = 60]
=	20	:	15	:	12	
Ratio of profits =	20×3 + 10×9	:	15×12	:	12×12	
=	150	:	15×12	:	12×12	
=	25	:	30	:	24	

Hence, option (c) is the correct answer.

57 (a)

Given series : * L& 1 > a % Q * Z 5 * 2 $ U E 7 O & 6 ^ 3 { 9 “T ! D # 4 F 6 ^ 3
After dropping the letters, we get: * & 1 > % * 5 * 2 $ 7 & 6 ^ 3 { 9 “ ! # 4 6 ^ 3
Seventeenth element from the right end: *
Fifth to the right of the seventeenth element: 6
So, option (a) is the correct answer.

58 (b)

Arya = (1/4) Sharda
Arya = 5 Konika
Arya + Himanshu = Luvkush + Konika …….(i)
Luvkush - Himanshu = Javitri
Or Luvkush = Himanshu + Javitri …….(ii)
Now, on putting Arya = 5 Konika and Luvkush = Himanshu - Javitri in equation (i):
Arya + Himanshu = Luvkush + Konika
Or 5 Konika + Himanshu = Himanshu + Javitri + Konika
Or 4 Konika = Javitri
Or Javitri = 4 × 7500 = 30000.
So, option (b) is the correct answer.

59 (d)

Here, we are required to decipher or decode the pattern.
LAPTOP is written as MWYUKY. We can see that the underlying pattern is very simple, as shown below:
$L + 1^2 = M$
$A - 2^2 = W$
$P + 3^2 = Y$
$T + 1^2 = U$
$O - 2^2 = K$
$P + 3^2 = Y$
We will follow a similar pattern to code BEACON.
$B + 1^2 = C$
$E - 2^2 = A$
$A + 3^2 = J$
$C + 1^2 = D$
$O - 2^2 = K$
$N + 3^2 = W$
So, the required code is CAJDKW.
Hence, option (d) is correct.

60 (d)

Let the length, breadth and height of the cuboidal room be l, b and h respectively.
The length of the longest pole that can be placed on the floor of the cuboidal room is equal to the length of the diagonal of the floor (a rectangle) with its sides as the length and breadth of the room.
So, $l^2 + b^2 = 5^2$……. I
The length of the longest pole that can be placed in the room in any manner is equal to the space diagonal of the cuboidal room.
So, $l^2 + b^2 + h^2 = (5\sqrt{2})^2$ …… II
Using I and II, we get:
$5^2 + h^2 = 50$
$\Rightarrow h^2 = 50 – 25$
$\Rightarrow h^2 = 25$
$\therefore h = 5$ m.
Hence, option (d) is correct.

61 (b)

Inference 1 is incorrect: The given inference is not correct because of the phrase 'not possible'. The passage is about how colonial rule impacted tribal societies and how it continues to do so. However, this option states that it is not possible to overcome those impacts. Whether it is possible or not is not discussed in the passage. Hence, this option is not correct because the passage does not state so.

Inference 2 is correct: The given inference is correct because of the line - "***Many engaged in armed uprisings,*** *such as the Santhal Rebellion and the Birsa Munda-led Munda Rebellion, seeking to reclaim their ancestral lands and resist cultural imposition."* This line shows that many (probably not all) adopted violent or armed means to resist cultural change. So, this inference is correct.

62 (d)

Option (a) is incorrect: The given option is not correct because the passage does not mention tribals to be the 'most' formidable opposition. The passage does not compare tribals with any other section in the context of opposing the British. So, this option is not correct.

Option (b) is incorrect: The passage is specific to tribals and mentions the opposition that tribals presented to the British (colonial rule). However, the passage does not cover the aspects of pre-colonial rule. So, this option is beyond the scope of the passage.

Option (c) is incorrect: The passage is specific to tribals and not generic to Indian society. However, the option is about Indian society in general. So, this option is not correct.

Option (d) is correct: This option is based on the following line - "*In response to colonial oppression, tribals mounted various forms of resistance."* It reflects the opposition aspect. Now, consider the line - "*The colonial legacy has left a* ***lasting impact on tribal communities****, contributing to issues like* ***displacement, poverty, and cultural marginalization****, which* ***continue to shape their socio-economic realities*** *in post-colonial India."* So, the colonial legacy affects the tribals even today with issues like poverty, marginalization etc. Hence, this option is correct.

63 (c)

Option (a) is incorrect: Refer to the line: *"Furthermore, economic growth wasn't always inclusive…"* The author clearly says that inclusive growth has happened, though not always. Therefore, it would be incorrect to say that inclusive growth has not happened at all. Furthermore, the context is not specific to any country. Therefore, this answer option is not correct as per the passage.

Option (b) is incorrect: The entire passage talks about how in many cases economic growth is not inclusive. The author lists the various factors that prevent the inclusive nature of economic growth. Therefore, it would be incorrect to say that economic growth is inherently inclusive in nature.

Option (c) is correct: The lines "***Inefficient implementation of social policies, bureaucratic hurdles, and corruption*** *hindered the effective delivery of welfare programs"* show that the government also grapples with issues related to inclusive growth. Also, the lines "*Economic development often prioritized urban and industrial areas,* ***leaving rural regions with inadequate access*** *to education, healthcare, and employment opportunities"* show that economic growth is not always inclusive in nature. Hence, the government should focus on making economic growth inclusive.

Option (d) is incorrect as option (a) is incorrect.

64 (d)

Assumption 1 is incorrect: The passage does mention the influence of British colonialism on Indian political institutions as reflected in the lines "*The British colonial administration laid the groundwork, introducing parliamentary structures that* ***continue to influence Indian politics****."* '*Parliamentary structures*' is one such example. However, there could be many other channels of influence. Therefore, it would be incorrect to say that Parliamentary structure is the 'only' way through which British colonialism has influenced Indian politics.

Assumption 2 is incorrect: The evolution as mentioned in the passage is because of the changing demands of the society as seen in the line "*Over the years, India's federal structure has evolved,* ***accommodating regional diversity*** *through the establishment of State Legislative Assemblies."* Therefore, evolution of political institutions reflects changing societal demands and not vice versa as mentioned in the option. So, this assumption is not correct.

65 (a)

Option (a) is correct: The given option is based on the following lines "*The **British colonial administration** ... continue to influence Indian politics. ... Over the years, **India's federal structure has evolved**, accommodating regional diversity through the establishment of State Legislative Assemblies. **Constitutional amendments and electoral reforms** have aimed at enhancing representation and inclusivity."* These lines depict the essence of the passage - transformation has happened in the political institutions and political landscape of the country from the colonial era to the present day. So, this best reflects the crux of the passage.

Option (b) is incorrect: The given statement is generic and not as per the information provided in the passage. The passage mentions about evolution of political institutions, but the associated complexities and limitations, if any, are not covered in the passage. Also, the main theme of the passage is to showcase the evolution of political institutions. Therefore, this option is not the best crux of the passage.

Option (c) is incorrect: The given passage is not about political parties and coalition partners, but the overall political landscape of the country at large. Therefore, this option is not the best crux.

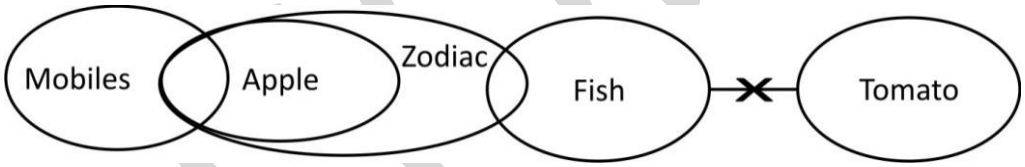
Option (d) is incorrect: The passage is primarily about the evolution of Indian political institutions. Also, there is nothing related to the evolution of Indian politics except the influence of the British administration over it. We cannot conclusively say that Indian politics has not evolved since independence. So, this is not the best crux of the passage.

66 (b)

From II, Ragini visited her in-laws on Monday. Thus, Ragini visited Goa on Tuesday.
So, option (b) is the correct answer.

67 (d)

Venn diagram:



Either conclusion I or III follows.
Hence, option (d) is the right answer.

68 (d)

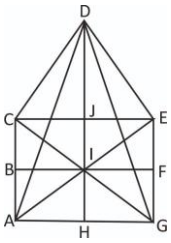
The given sequence: wx_ivQhw_giVqhWx_ _vqH
We can break this sequence in three sets of 7 elements each. We can see that every third letter is a capital letter.
The complete sequence is: wx**G**ivQh/w**X**giVqh/Wx**gI**vqH.
Hence, option (d) is correct.

69 (d)

17 + (2 * 3) = 23
23 + (3 * 4) = 35
35 + (4 * 5) = 55
55 + (5 * 6) = 85
85 + (6 * 7) = 127
Hence, option (d) is the right answer.

70 (b)

The figure:

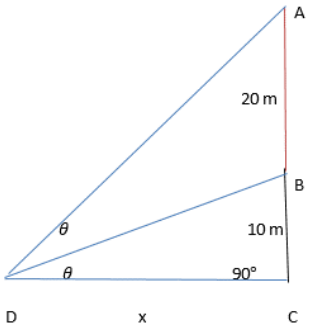


There are 3 horizontal lines, namely AG, BF, and CE.
There are 3 vertical lines, namely AC, HD, and GE.
There are 6 slant lines, namely AD, AE, GC, GD, CD, and ED.
Thus, there are 3 + 3 + 6 = 12 straight lines in all.
Hence, option (b) is the right answer.

71 (c)

Ratio of water and sugar in mixture 1 = 5 : 1
Quantity of water in mixture 1 = {5/(5+1)} x 18 = 15 litres
Quantity of sugar in mixture 1 = {1/(5+1)} x 18 = 3 litres
Ratio of water and sugar in mixture 2 = 1 : 6
Quantity of water in mixture 2 = {1/(1+6)} x 28 = 4 litres
Quantity of sugar in mixture 2 = {6/(1+6)} x 28 = 24 litres
In new mixture, there is some extra water. Let it be x.
So, total quantity of water in the new mixture = 15 + 4 + x = 19 + x
Total quantity of sugar in the new mixture = 3 + 24 = 27 litres
According to the question,
(19 + x)/27 = 8/9
Or 19 + x = 24
Or x = 5
Total quantity of water in the new mixture = 19 + x = 19 + 5 = 24 litres
Hence, option (c) is the correct answer.

72 (a)



Let AC be the pole. Given, AC = 30 m, BC = 10 m.
So, AB = 30 – 10 = 20 m.
Let DC = ‘x’ m. So, in right angled ΔDBC,
tanθ = BC/DC
or, tanθ = 10/x ……. I
Also, in right angled ΔADC,
tan (θ+θ) = AC/DC
⇒ tan2 θ = 30/x
⇒ $2\tan\theta/(1-\tan^2\theta) = 30/x$
⇒ $[2(10/x)]/(1-(10/x)^2) = 30/x$ [From I]
∴ x = 10√3 m.
So, the distance of the point from the base of the pole = 10√3 m.
Hence, option (a) is the correct answer.

73 (d)

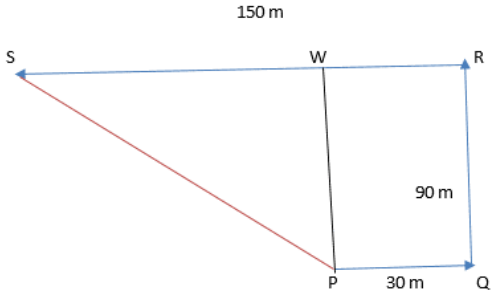
Let 10 years ago the ages of Abhishek and Aishwarya were 5x and 4x.
So, the present ages of Abhishek and Aishwarya would be (5x + 10) and (4x + 10) respectively.
According to the question,
5x + 10 = 4x + 10 + (1/6) × (4x + 10)
Or 5x = 4x + (1/6) × (4x + 10)
Or x = (1/6) × (4x + 10)
Or 6x = (4x + 10)
Or 2x = 10
Or x = 5
So, Present age of Abhishek = 5x + 10 = 5×5 + 10 = 25 + 10 = 35 years
Present age of Aishwarya = 4x + 10 = 4×5 + 10 = 20 + 10 = 30 years
The total present age of the family = 35 + 30 + (9×3) + (6×2) + 3 = 107 years
Hence, option (d) is the correct answer.

74 (d)

The total number of girls who attended Bengali and Geography = {800 × (16/100) × (7/16)} + {800 × (23/100) × (5/8)} = 56 + 115 = 171
The total number of boys who attended Hindi and Biology = {800 × (22/100) × (1/4)} + {800 × (25/100) × (3/10)} = 44 + 60 = 104
Required difference = 171 – 104 = 67
Hence, option (d) is the correct answer.

75 (d)

The path taken by the person is represented below:



PQ = 30 m; QR = 3PQ = 90 m; RS = 5PQ = 150 m
SW = RS – RW = 150 – 30 = 120 m.
In ΔPWS, $PS^2 = PW^2 + SW^2 = 90^2 + 120^2 = 22500$
Hence, the shortest distance, PS = 150 m.
Hence, option (d) is the correct answer.

76 (b)

The selection of the players can be done in the following ways:

	Group A (Number of ways)	**Group B (Number of ways)**
Case I	2 Men $({}^2C_2)$	2 Women $({}^2C_2)$
Case II	1 Man + 1 Woman $({}^2C_1) \times ({}^3C_1)$	1 Man + 1 Woman $({}^3C_1) \times ({}^2C_1)$
Case III	2 Women $({}^3C_2)$	2 Men $({}^3C_2)$

Hence, the required number of ways = $({}^2C_2 \times {}^2C_2) + ({}^2C_1 \times {}^3C_1 \times {}^3C_1 \times {}^2C_1) + ({}^3C_2 \times {}^3C_2)$ = (1 × 1) + (2× 3× 3× 2) + (3× 3) = 1 + 36 + 9 = 46 ways.
Hence, option (b) is the correct answer.

77 (b)

Inference 1 is incorrect: The context of the state and what it should do for cybersecurity is not covered in the passage. Therefore, this inference is beyond the scope of the passage.
Inference 2 is correct: The given inference is based on the lines "*The ethical hacker, or "white hat," **employs the same techniques** as malicious hackers **but** with the **goal of identifying and fortifying security** weaknesses rather than exploiting them."* These lines show that ethical hackers know everything that malicious hackers know, but they use it for noble objectives. So, essentially, they have the potential to become malicious hackers. Hence, this inference is correct.

78 (b)

Option (a) is incorrect: The passage talks about the paradox of morality and the various reasons behind it. However, this option focuses only on the individual and his established beliefs. So, this option does not reflect the most rational inference.

Option (b) is correct: The given option captures the essence of the passage, which is the paradox of morality and the reasons behind it. This is seen in the lines "*The **paradox of morality lies in the intricate tension between universal principles and cultural relativity**, … **Cultural context moulds moral frameworks**, giving rise to situations where actions deemed **morally acceptable in one culture may be condemned in another**."* And "…..the paradox of morality extends to the internal conflict within individuals. ***Personal moral convictions may clash with societal norms***, creating a complex internal struggle." So, this option is the most rational inference.

Option (c) is incorrect: This option differentiates between morality and ethical relativism. However, the central theme of the passage is the paradox of morality and various reasons leading to it. So, this option is not the most rational inference.

Option (d) is incorrect: The given option is quite vague and is not based on the passage, because the context of critical examination of cultural boundaries is not covered in the passage. So, this option is beyond the scope of the passage.

79 (c)

Assumption 1 is incorrect: The given assumption is extreme and is not based on the information provided in the passage. Conscience and legal frameworks are tools of decision-making. Though sometimes they might be wrong, but to state that they are not reliable would not be correct.

Assumption 2 is incorrect: The given assumption is not correct because of the lines "*Adherence to legal and regulatory standards may **lack the flexibility** to address every moral dilemma and **may not always align with evolving societal values***". This line shows that societal values may or may not impact the legal frameworks.

80 (b)

Option (a) is incorrect: The given option is quite generic in nature and does not cover the specific context of the passage, which is about the reliability of conscience compared to laws. The passage compares the approach of conscience and laws towards ethical decision-making. So, this option is not the most rational inference.

Option (b) is correct: The passage is about conscience, laws and how they help in ethical decision-making. The lines from the passage "*While it can provide a sense of individual integrity, its subjectivity **raises concerns about consistency and potential biases**. Laws, rules, and regulations, on the other hand, offer a structured framework for ethical behaviour … **may lack the flexibility to address every moral dilemma** and may not always align with evolving societal values."* show that both conscience and laws, etc. are used in decision-making, but there is some complexity involved in their reliability. This is because of the inconsistency in conscience and lack of flexibility in laws. So, there is uncertainty about their reliability and it's a debatable topic, as highlighted in the line – "***The ongoing dialogue between personal conscience and legal frameworks is essential*** …".

Option (c) is incorrect: The given option is not covered in the passage, because whether conscience and law complement each other, or whether they are mutually exclusive or not is not discussed in the passage. The passage only mentions their features and differences. So, this option is not correct as per the passage.

Option (d) is incorrect: The context of adaptability and its impact on the reliability of conscience or legal frameworks is not discussed in the passage. Hence, this option is not correct.