ANSWERS & EXPLANATION

APTITUDE TEST–Test (4285) – 2024

1 (d)

Let's check each set one by one.
(i) {x: x ∈ R and 0<x<1}
There can be infinite real numbers in between 0 and 1.
So, it is an infinite set.
(ii) D = {x: x is divisor of 50}
There are limited number of divisors of 50.
So, it's a finite set.
(iii) C = {The set of prime numbers less than 10} = {2, 3, 5, 7}
So, it is a finite set too.
(iv) Set of all lines in a given plane.
We know that there can be infinite number of lines in a plane. So, it is an infinite set.
Hence, (i) and (iv) are infinite sets.
So, option (d) is the right answer.

2 (a)

Let Sameer had Rs. x.
Money that Alok got = (2/5) x
Money that Yogesh got = (2x/5) × 2/5 = 4x/25
Yogesh got Rs. 2100 less than the total money that Sameer had at the start.
∴ x – (4x/25) = 2100
Or 21x/25 = 2100
Or x = 2100 × 25 /21
Or x = 2500
∴ Money that Alok got = (2/5) x = (2/5) × 2500 = Rs. 1000
Hence, option (a) is the right answer.

3 (b)

Let the number be 10x + y
Number obtained by reversing its digits = 10y +x
Sum of these two numbers = (10x + y) + (10y + x) = 99
Or 11x + 11y = 99
Or x + y = 99/11 = 9
The first digit is 2.
∴ Second digit of the number = 9 – 2 = 7
Hence, option (b) is the right answer.

4 (d)

In any pie chart, the total central angle is 360°.
Loan from all the sources = 32570 + 200000 + 18430 + 500000 + 100000 = Rs. 851000
Loan on credit card = Rs. 100000
So, 851000 = 360°
1 = 360°/ 851000

So, 100000 = (360^o/851000) × 100000 = 42.30^o
∴ The central angle made by the "loan on credit card" section is 42.30^o.
Hence, option (d) is the right answer.

5 (a)

Assumption 1 is correct. The given assumption is correct, as it is based on the following lines from the passage - "*The manifest failures of corporate governance and business ethics in the global financial crisis have increased the urgency of the search for a better ethical framework and governance for business."*
Assumption 2 is incorrect. The passage does not mention anything related to accountability before industrialism. Hence, this assumption is beyond the scope of the passage.

6 (b)

Option (a) is incorrect. The context of the trust of the people and its link with accountability is not a part of the passage and is, therefore, not correct. This option is beyond the scope of the passage.
Option (b) is correct. The central theme of the passage is the increasing need for ethics in business since the time of industrialism. The lines, "*The balance of pursuing market opportunities while maintaining accountability and ethical integrity has proved a defining challenge for business enterprises since the arrival of the joint-stock company in the early years of industrialism*" and "*A substantial increase in the range, significance, and impact of corporate social and environmental initiatives in recent years suggests the growing materiality of a more ethically informed approach*" reflect the same. Hence, as per the passage, the given option is correct.
Option (c) is incorrect. This option states a relationship between ethics and accountability and responsibility in corporate governance. However, the passage does not state so explicitly. So, this option is not correct as per the information given in the passage.
Option (d) is incorrect. The given option is not correct, because the fact that financial crisis is the "real test" of any approach to corporate governance or business ethics has not been stated in the passage.

7 (b)

Statement 1 is not correct. The passage does not mention that Census will be held in 2024. Rather, it just says that Census will not be conducted in 2023. It does not give any timeline regarding the census. **Hence, it is not a correct statement.**
Statement 2 is correct. The passage says that - *"the census is a process that may form the basis of the development agenda. Digital, complete, and accurate census figures will have multi-dimensional benefits, he said, adding planning based on the census data ensures development reaches the poorest of the poor".*
It can be inferred from this that census may help in ensuring that fruits of development reach the last mile.
Hence, it is a correct statement.

8 (c)

Let Ram and Shyam together take x hours to complete the work.
∴ Work done by Ram and Shyam in one day = 1/x units
Also, the time in which Ram alone can finish the work = (x + 8) hours
And, the time in which Shyam alone can finish the work = {x + (9/2)} hours
Now, 1/x = {1/(x + 8)} + {1/ (x + (9/2)}
Or 1/x = {1/(x + 8)} + {2/(2x + 9)}
Or x(4x + 25) = (x + 8) (2x + 9)
Or $4x^2 + 25x = 2x^2 + 9x + 16x + 72$
Or $2x^2 = 72$
Or $x^2 = 36$
Or x = 6 hours
Thus, they together can complete the work in 6 hours.
Hence, option (c) is the right answer.

9 (c)

The various possible ratios are:
(1 : 5, 1 : 6, 1 : 7, 1 : 8)
(2 : 5, 2 : 6, 2 : 7, 2 : 8)

(3 : 5, 3 : 6, 3 : 7, 3 : 8) …(3 : 6 = 1 : 2)
(4 : 5, 4 : 6, 4 : 7, 4 : 8) …(4 : 8 =1 : 2)
We can see that there are only 2 possible cases in which the ratio of chocolate and strawberry paste is 1 : 2.
Hence, option (c) is the right answer.

10 (b)

Section of students taking other modes of transportation = 1 – {(1/4) + (1/6) + (1/3) + (5/36)} = 1/9
Total number of students = 2160
∴ Required number = (1/9) × 2160 = 240
Hence, option (b) is the right answer.

11 (a)

The given number is 810A4B6C.
We need to find A+B+C.
From statement 1:
As the number is a multiple of 5 and 8, so C = 0.
As the number is a multiple of 8, so its last three digits should be divisible by 8. Thus, the value of B can be 1, 3, 5, 7, or 9.
As the number is a multiple of 9, the sum of its digits must be a multiple of 9 too.
Sum of the digits of 810A4B60 = 8 + 1 + 0 + A + 4 + B + 6 + 0 = 19 + A + B
If B = 1, then A has to be 7, for the number to be divisible by 9.
Similarly, if B = 3, then A has to be 5.
If B = 5, then A has to be 3.
If B = 7, then A has to be 1.
If B = 9, then A has to be 8.
The possible values of A and B have been listed below:

A	B	C
7	1	0
5	3	0
3	5	0
1	7	0
8	9	0

From Statement II:
Both A and B are non- prime numbers.
Only A = 8 and B = 9 satisfy the above condition.
∴ A + B + C = 8 + 9 + 0 = 17
Hence, option (a) is the right answer.

12 (c)

Ashok, Manoj and Rakesh together can complete a work in 30 minutes.
So, Ashok, Manoj and Rakesh's work efficiency = 1/30
Ashok and Manoj can complete the work in 50 minutes.
So, Ashok and Manoj's work efficiency = 1/50
∴ Rakesh's work efficiency = (1/30) – (1/50) = 2/150 = 1/75
Hence, Rakesh alone can finish the work in 75 minutes.
So, option (c) is the right answer.

13 (b)

From S1:
N divides x and y.
So, let x = Nk, and y = Nr
N will be the HCF of x and y only if k and r are co-primes, otherwise not.
∴ S1 alone is not sufficient.
From S2:
2N divides x/2 and y/4.
So, let $x/2 = 2Nk_1$, and $y/4 = 2Nr_1$

∴ 4N divides x and y
So, N is not the HCF of x and y.
∴ S2 alone is sufficient.
Hence, option (b) is the right answer.

14 (c)

Total earnings in 2018 = Rs. 500000
Earning from House Rent in 2018 = 25% of Rs. 500000 = Rs. 125000
Total earnings in 2019 = Rs. 600000
Earning from House rent in 2019 = 23% of Rs. 600000 = Rs. 138000
Required percent = [(138000 – 125000)/125000] × 100 = (13000 × 100)/125000 = 10.4%
So, option (c) is the right answer.

15 (d)

Total earnings in 2018 = Rs. 500000
Earning from selling milk in 2018 = 9% of 500000 = Rs. 45000
Total earnings in 2019 = Rs. 600000
Earning from selling milk in 2019 = 8% of 600000 = Rs. 48000
Required difference = 48000 –45000 = Rs. 3000
So, option (d) is the right answer.

16 (c)

Statement 1 is correct. The passage clearly states that **"low-frequency gravitational waves – ripples in the fabric of space-time that are created by huge objects moving around, colliding, and merging with each other, and predicted by Albert Einstein's General Theory of Relativity more than 100 years ago."** Hence, it is a correct statement.
Statement 2 is correct. The passage clearly mentions that **"Gravitational waves were first detected in 2015 using an experiment, involving Laser Interferometer Gravitational Observatory (LIGO) detectors. But those waves were of high frequency"**. The passage further says that **"In a bid to discover low-frequency gravitational waves, scientists used an entirely different technology compared to the one used eight years ago".** Therefore, it can be inferred that LIGO technology was earlier probably more useful in detecting high-frequency gravitational waves. **Hence, it is a correct statement.**

17 (c)

Statement 1 is correct: The gravitational waves are produced by the collision of massive objects in space. The passage says that **"ripples in the fabric of space-time that are created by huge objects moving around, colliding, and merging with each other". Hence, it is a correct statement.**
Statement 2 is correct: In 2015, an experiment utilizing LIGO detectors made the first observation of gravitational waves, thought to have been created around 1.3 billion years ago. The passage mentions that **"Gravitational waves were first detected in 2015 using an experiment, involving Laser Interferometer Gravitational Observatory (LIGO) detectors. But those waves were of high frequency, believed to be produced by the merger of two relatively small black holes that took place about 1.3 billion years ago". Hence, it is a correct statement.**

18 (a)

Option (a) is correct: The passage in the first line itself mentions the huge number of deaths caused by unsafe drinking water and lack of sanitation. Further, the passage narrates the diseases caused by contaminated water, globally. The passage says that **"Globally, 771 million people lack access to safe water and 1.7 billion people don't have a toilet. The WHO report is based on the estimates of the burden of diseases attributable to unsafe WASH".** This is the reflection of the central theme of the passage. Hence, **it is the correct option.**
Option (b) is not correct: The passage has not compared the data across multiple years. So, we cannot say for certain if such diseases are on the rise or on the way down. Moreover, it is not a part of the crucial message that the author wants to convey – it is a supporting argument. The issues of sanitation and hygiene have also not been covered by this option. **Hence, it is not a correct option.**

Option (c) is not correct: The passage in the initial lines mentions the death of children under 5, which is caused by unsafe drinking water. But the passage nowhere mentions that children under 5 are the most susceptible to waterborne diseases. Anyways, even if true, it cannot be the most crucial message of the author. **Hence, it is not a correct option.**
Option (d) is not correct: Nowhere does the passage mentions Africa being the most susceptible continent to waterborne diseases. **Hence, it is not a correct option.**

19 (c)

∅ means a null set.
From statement –1:
Z represents integers. An integer can be 0, a positive number to infinity, or a negative number to negative infinity.
$\{x: x \in Z \text{ and } x^2 = 2\} = \emptyset$
It is right, because there is no integer whose square is 2.
Statement– 2:
The letter N is the symbol used to represent natural numbers. Natural numbers are also known as counting numbers, and they begin with the number 1 and continue to infinity.
$\{x: x \in N, 4 < x < 5\} = \emptyset$
It is also right, because there can be no natural number between 4 and 5.
Hence, option (c) is the right answer.

20 (d)

We have to determine whether $(a – b + c) > (a + b – c)$.
Or if, $-b + c > b – c$
Or if, $2c > 2b$
Or if, $c > b$
From Statement 1: $4ab > 0$
But c is not mentioned in Statement 1.
Hence, Statement 1 alone is not sufficient.
From Statement 2: $b < (a + c)$
If $a < 0$, we can infer that $c > b$.
But we do not know whether a is positive or negative.
Hence, Statement 2 alone is not sufficient.
Even by combining both the statements, we cannot answer the question.
Hence, option (d) is the right answer.

21 (a)

The first 5 prime numbers of the number system are 2, 3, 5, 7 and 11.
The first 5 composite numbers of the number system are 4, 6, 8, 9 and 10.
So $x = (2 + 3 + 5 + 7 + 11)/5 = 28/5$ and
$y = (4 + 6 + 8 + 9 + 10)/5 = 37/5$
So, the required difference = $y – x = 37/5 - 28/5 = (37 - 28)/5 = 9/5 = 1.8$
So, option (a) is the right answer.

22 (b)

Let three workers be x, y and z.
x can complete the work in 16 hours.
y can complete the same work in 12 hours.
x, y and z together can complete the same work in 4 hours.
So, x's one hour's work = 1/16
y's one hour's work = 1/12
(x + y + z)'s one hour's work = 1/4
∴ z's one hour's work = (1/4) – [(1/16) + (1/12)] = (1/4) - (7/48) = 5/48
Hence, z alone can complete the work in 48/5 i.e. 9.6 hours.
So, option (b) is the right answer.

23 (c)

Option (a) is incorrect. The context of changing perceptions, that too about the financial independence of women, is not the focus of the passage. The passage focuses on the importance of financial independence of women and its role in gender equality. Therefore, this option does not best reflect what the passage implies.

Option (b) is incorrect. The given option is too broad in context, and does not even mention women. In comparison, option (c) perfectly captures the context of the passage in a specific manner. So, this option does not best reflect what the passage implies.

Option (c) is correct. The passage line, "*prioritises equal access for women to the full range of financial services available to men. This will allow them the same opportunities as men to participate fully in economic activity"* implies that ensuring equal access to financial services for women can help them overcome gendered challenges and have the same opportunities as men. This implies that achieving gender equality relies on empowering women financially, allowing them to be independent and on par with men in terms of economic participation.

Option (d) is incorrect. Though making women financially literate will be a step in the right direction, but this is too narrow a statement. The context of the passage is much wider, which talks about "… *prioritises equal access for women to the full range of financial services available to men*". Hence, this option does not best reflect what the passage implies.

24 (a)

W = MDH (formula)
Where, W = work; M = man (number of persons); D = days (number of days); H = hours (hours per day)
So, $60\times 9 \times 27 = 30 \times 162 \times x$
(x= hours a day needed by each of the 30 men)
$\Rightarrow$ x = $(60 \times 9 \times 27)/(30 \times 162)$ = 3 hours.
So, option (a) is the right answer.

25 (d)

Let 1 boy's 1 day's work = x (i.e. efficiency of 1 boy = 'x' units/day) and
1 girl's 1 day's work = y (i.e. efficiency of 1 girl = 'y' units/day).
Then, $9x + 12y = 1/15$ ……I
(9 boys' & 12 girls' 1 day's work)
$39x + 72y = 1/3$ ……II
(39 boys' & 72 girls' 1 day's work).
Multiplying equation I by 6 and then subtracting equation II from it, we get,
$x = 1/225$.
Putting the value of x in either equation I or equation II will yield
$y = 1/450$.
So, 20 boys' and 5 girls' 1 day's work
= $20/225 + 5/450 = 1/10$.
Since $1/10$ part is performed in 1 day.
So, 1 part is performed in $1/((1/10))$ day, i. e., 10 days.
So, option (d) is the right answer.

26 (d)

Let us assume that Raj alone can complete the work in x days.
So, Raj's one day work = 1/x
Time taken by Shubham to complete half the work = x/4 days
So, Time taken by Shubham to complete the whole work = 2 × (x/4) = x/2 days
So, Shubham's one day work = 2/x
Given that, Shubham and Raj together can complete the work in 18 days.
So, Shubham and Raj's one day work = 1/18
So, (1/x) + (2/x) = 1/18
Or, 3/x = 1/18
Or, x = 54 days
Thus, Raj alone can complete the work in 54 days.
Hence, option (d) is the right answer.

27 (c)

Given, $M = 7^{2N} - 1$, where $N \varepsilon N$
$M = ((7)^2)^N - 1 = 49^N - 1$
$a^N - b^N$ is always divisible by $(a - b)$ if N is a natural number.
So, $49^N - 1$ is divisible by $(49 - 1)$, i.e. 48.
Hence, $49^N - 1$ must also be divisible by 6 for any value of N.
So, option (c) is the right answer.

28 (c)

The smallest number that satisfies the given condition is obtained by taking the LCM of the numbers 6, 13 and 17, and adding the remainder 3 to it.
LCM of 6, 13 and 17 = 1326
Hence, the required number = 1326 + 3 = 1329
So, option (c) is the right answer.

29 (b)

Let the efficiency of Amar = x = 100%.
Then, the efficiency of Sanjay = y = 125%.
Ratio of efficiencies, $x/y = (100\%)/(125\%) = 4/5$.
As the time taken to complete a work is inversely proportional to the respective efficiencies, so the time taken by Amar (let, m) and Sanjay (let, n) to complete the work will be in the ratio of 5:4.
So, $m/n = 5/4$
$\Rightarrow 20/n = 5/4$
$\Rightarrow$ n = 16 days
Hence, option (b) is the right answer.

30 (b)

Next time when they would fall simultaneously = 11 am + LCM of time intervals
= 11 am + LCM (45 seconds, 60 seconds, 75 seconds, 90 seconds)
= 11 am + 900 seconds
= 11 am + 15 minutes
= 11:15 am.
Hence, option (b) is the right answer.

31 (c)

Ananya and Rudra can together complete a work in 30 days.
Ananya and Rudra's 1 day work = 1/30
They actually worked together only for 20 days.
Ananya and Rudra's 20 days' work = (1/30) × 20 = 2/3
$\therefore$ Remaining work = (1 – 2/3) = 1/3
1/3 part of the work can be completed by Ananya in 20 days.
So, 1 part of the work can be completed by Ananya in 3 × 20 = 60 days.
Hence, option (c) is the right answer.

32 (d)

Total Marks obtained by Ravina = 540
$\therefore 360^o = 540$
$1^o = 540/360$
Central angle made by the pie-section representing the marks of English = 360 – (90 + 55 + 70 + 65) = 360 – 280 = 80^o
$\therefore$ Marks in English = (540/360) × 80 = 120 marks

$\therefore$ Required percent = (120/540) × 100 = 22.22%
So, option (d) is the right answer.
Note: We can also calculate it as (80/360) × 100 = 22.22%

33 (d)

Let us first calculate the angles made by each part at the centre.
Total expenses incurred in the marriage ceremony = Rs. 990000
So, Rs. 990000 = 360^o
or Rs. 1 = $360^o/990000 = (1/2750)^0$
∴ Angle made by Transportation = $55000/2750 = 20^o$
∴ Angle made by Food = $247500/2750 = 90^o$
∴ Angle made by Gifts = $330000/2750 = 120^o$
∴ Angle made by Hall = $165000/2750 = 60^o$
∴ Angle made by Decoration = $192500/2750 = 70^o$
It can be written in fraction as:
Transportation = $20^o/360^o = 1/18$
Food = $90^o/360^o = 1/4$
Gifts = $120^o/360^o = 1/3$
Hall = $60^o/360^o = 1/6$
Decoration = $70^o/360^o = 7/36$
Hence, option (d) is the right answer.

34 (d)

Option (a) is incorrect. The passage does not link the concepts of unquenchable thirst and human happiness. Therefore, to conclude that unquenchable thirst is a hindrance to happiness would not be correct.
Option (b) is incorrect. The line "*The capitalist system, dependent on a logic of never-ending growth from its earliest inception, confronted the plenty it created in its home states, especially the US, as a threat to its very existence"* only shows that the US faced the issue of plenty due to the capitalist model of growth. However, to conclude that consumerism model should not be adopted by any country is an extreme statement and is not based on the information given in the passage. Therefore, this option is not correct.
Option (c) is incorrect. The passage majorly mentions the disadvantages of consumerism and hardly mentions any benefits. So, to state that disadvantages outweigh benefits is not correct in the absence of such a comparison. Hence, this option is not correct.
Option (d) is correct. The passage critically discusses the implications of the "commodification of reality" and the "manufacture of demand" in the context of the capitalist system. It highlights how capitalism relies on a logic of never-ending growth and confronts the plenty it creates as a threat to its existence. The passage emphasizes how capitalism has shaped the *"ordinary person into a consumer with an unquenchable thirst for material possessions"*. Therefore, the underlying tone of the passage aligns with statement (d), as it acknowledges the focus on consumerism within the capitalist model of growth and its impact on transforming individuals into perpetual consumers.

35 (d)

Inference 1 is incorrect. The given inference is not correct because the passage does not confirm whether they are aware or not. The passage only mentions that, "*They **often use an ancient method** of clearing called slash-and-burn. First, the farmer cuts all the brush in her plot."* This means that they mostly use slash-and-burn. But to infer that they are not aware of modern-day technology would not be correct.
Inference 2 is incorrect. The passage does not compare permanent crops and rotational crops in the context of benefits. So, this inference is not correct as per the information given in the passage.

36 (d)

Option (a) is incorrect. The passage nowhere mentions that agriculture is the main occupation of women in Coastal West Africa. The passage only mentions, "*In coastal West Africa, farmers, **usually** women, plant corn soon after the first rains of the growing season."* Hence, as per the passage, this option is not correct.
Option (b) is incorrect. The context of remuneration of farming is not a part of the passage. Hence this option is not correct.
Option (c) is incorrect. Whether slash-and-burn is the best method as per the geography of Coastal West Africa or not has not been mentioned in the passage. The lines, "*They often use an ancient method of clearing called slash-and-burn. First, the farmer cuts all the brush in her plot. When this vegetation dries, she sets fire to it."* Only show that this method is practiced there. Hence, this option is not correct as per the passage.

Option (d) is correct. The given option is correct because of the lines, "*Agricultural methods often vary widely around the world, depending on climate, terrain, traditions, and available technology. ….. Higher-technology farming* ***involves crop rotation, which requires knowledge of farmable land.****"* Therefore, it would be correct to say that probably not everybody could practice high-technology farming.

37 (a)

Ratio of the efficiencies of A and B = A : B = 4 : 1
Both together can complete a work in 28 days.
Let, Total work = 28 × (4 + 1) = 140 units
Time taken by A alone to complete the work = 140/4 = 35 days
Hence, option (a) is the right answer.

38 (c)

Let the number of dresses Shubham has be N.
LCM of (20, 30, 50) = 300
Hence, N is of the form 300k + 16.
We have to find out the value of k for which (300k + 16) is divisible by 14.
By hit and try method, we can see that for k = 2, (300k + 16) is divisible by 14.
So, the minimum number of dresses he has = 300 × 2 + 16 = 616
So, option (c) is the right answer.

39 (b)

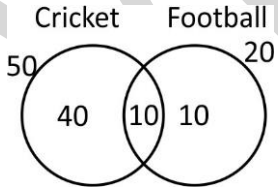
Let the number of students seated in each bus be N.
Number of buses required, R = (60/N) + (36/N) + (24/N)
For R to be minimum, 60/N, 36/N, 24/N must be minimum. For this to happen, N must be maximum.
HCF of 60, 36, 24 = 12
So, Minimum number of buses required = (60/12) + (36/12) + (24/12) = 5 + 3 + 2 = 10
Hence, option (b) is the right answer.

40 (b)

Let A be the set of people who support party A, and B be the set of people who support party B.
So, n(A) = 4200; n(B) = 2500; n (A ∩ B) = 1600
Now, n(A ∪ B) = n(A) + n(B) – n (A ∩ B)
= 4200 + 2500 – 1600
= 6700 – 1600
= 5100
∴ The number of people neither supporting A nor B = n(∪) – n (A∪ B) = 8000 – 5100 = 2900
Hence, option (b) is the right answer.

41 (c)

On the basis of the information given in the question, we can draw the following Venn diagram.



Number of persons who play at least one of these two games = 40 + 10 + 10 = 60
Hence, option (c) is the right answer.

42 (c)

Let the two numbers be 12a and 12b, where a and b are co-prime.
Given, 12a + 12b = 588
Or a + b = 588/12 = 49
Product of the two numbers will be the maximum when a and b are as close to each other as possible.
So, a = 24 and b = 25
∴ The largest possible product = 12a × 12b = (12 × 24) × (12 × 25) = 86400
Hence, option (c) is the right answer.

43 (a)

The man's age can be 27 when the son was born.
Daughter was born when he was 29.
His age will be a perfect cube again when he is 64.
Sum of ages of man, his son and his daughter = 64 + (64 -29) + (64 -27) = 136 years.
Note: The other perfect cubes, 8 and 64 are not appropriate as per the given options.
Hence, option (a) is the right answer.

44 (b)

25% = 24000
Or 1% = 24000/25
The percentage of people of age group 36-60+ that were taking a foreign trip is 30%.
30% = (24000/25) × 30 = 28800
Hence, option (b) is the right answer.

45 (b)

Percentage of foreign travelers in the age group of 5-10 years = 20%
Percentage of foreign travelers in the age group of 11-20 years = 10%
So, Required ratio = 20:10 = 2:1
Hence, option (b) is the right answer.

46 (d)

Work done by A and B in two days when working on alternate days = 1/10.
Work done by C in one day = 1/30.
Work done in 3 days (A works on day 1, B on day 2 and C on day 3) = 1/10 + 1/30 = 4/30 = 2/15.
Work is completed in 15/2 = 7.5 such set of 3 days.
Work done in 7 such set of 3 days = 14/15.
Remaining 1/15 work is completed either by A on 22nd day or by B on 23rd day
Hence, option (d) is the right answer.

47 (c)

The number of people shortlisted from cities E and F = (14 + 20)% of 1400 = (1400 × 34)/100 = 476
The number of people that participated from cities B and E = (22 + 20)% of 6600 = (6600 × 42)/100 = 2772
Required percent = (476 × 100)/2772 = 17.17%
Hence, option (c) is the right answer.

48 (b)

Number of people that participated from city A = (6600 × 10)/100 = 660
Number of people that participated from city B = (6600 × 22)/100 = 1452
Number of people that participated from city C = (6600 × 12)/100 = 792
Number of people that participated from city G = (6600 × 4)/100 = 264
Now,
Number of people shortlisted from city A = (1400 × 22)/100 = 308
Number of people shortlisted from city B = (1400 × 10)/100 = 140
Number of people shortlisted from city C = (1400 × 4)/100 = 56
Number of people shortlisted from city G = (1400 × 12)/100 = 168
Shortlisting to participation percentage for city A = (308/660) × 100 = 46.66%
Shortlisting to participation percentage for city B = (140/1452) × 100 = 9.64%
Shortlisting to participation percentage for city C = (56/792) × 100 = 7.07%
Shortlisting to participation percentage for city G = (168/264) × 100 = 63.63%
Hence, this percentage or ratio is the highest for city G.
Hence, option (b) is the right answer.

49 (a)

Assumption 1 is correct. The given assumption is correct because the assertion in the statement is validated by the lines - "*Fully one-third of judicial postings lie vacant. The ability of state and local governments to impartially deliver basic welfare services is extremely limited. If these infirmities exist, so will criminal politicians"* from the passage. Hence, as per the passage, this assumption is correct.
Assumption 2 is incorrect. The context of increasing taxes to increase revenue, and thereby fill the vacancies is not a part of the passage. Hence, this assumption is beyond the scope of the passage.

50 (c)

Option (a) is incorrect. The given option is not correct because it is an extreme statement and not based on the information in the passage. The lines "*Good governance in modern democracy means the democratization of governance*." show that "good governance" is about the democratization of governance, but the statement mentions only "governance". Hence, as per the passage, this is not the best inference.
Option (b) is incorrect. The passage is not restricted to the governance of the local bodies. Hence, this inference is not correct.
Option (c) is correct. The option reflects the best rational inference as seen in the lines, "*Good governance in modern democracy means the democratization of governance. In participatory democracy, people elected their leader to govern them.* ***But governance is not the monopoly of elected leaders."***
Option (d) is incorrect. The given statement is not correct as per the lines, *"Good governance in modern democracy means the democratization of governance."* So, good governance and democratization of governance are linked to each other. Therefore, this inference is not correct as per the passage.

51 (b)

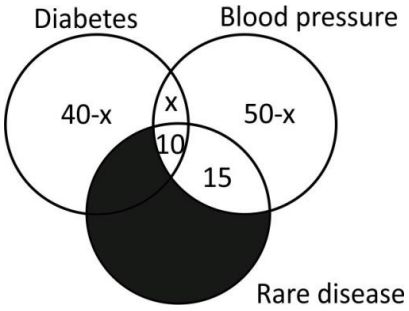
Let us assume that working alone Arijit completes the task in 'a' days, Brajesh completes in 'b' days and Chandan completes in 'c' days.
$1/a + 1/b = 1/10$ .....(1)
$1/b + 1/c = 1/15$ ..... (2)
It is also given that:
$5/a + 8/b + 9/c = 1$
Or $5(1/a + 1/b) + 3(1/b + 1/c) + 6/c = 1$
Using (1) and (2),
$5/10 + 3/15 + 6/c = 1$
Or $6/c = 1 - ½ - 1/5 = 3/10$
Or $c = 20$.
Chandan can finish the task alone in 20 days.
Hence, option (b) is the right answer.

52 (c)

On Saturday he earns Rs. 205, which is Rs. 5 and Rs. 25 more than what he earns on Monday and Tuesday respectively.
So, Earning on Monday = 205 – 5 = Rs. 200
Earning on Tuesday = 205 – 25 = Rs. 180
Earning by a man on Wednesday is three-fourth of the money he earns on Monday and Tuesday combined.
So, Earning on Wednesday = (200 + 180) × (3/4) = 380 × 3/4 = Rs. 285
In the next two days his earning is half of what he earns in the previous three days combined.
So, Earnings on Thursday + Friday = (200 + 180 + 285) / 2 = 665/2 = Rs. 332.5
Total earnings in the whole week = 200 + 180 + 285 + 332.5 + 205 = Rs. 1202.5
Hence, option (c) is the right answer.

53 (c)

Total number of families = 100
Let families suffering from diabetes and blood pressure only be x.
On the basis of the given information, we can draw the following Venn diagram:



Only 10 families have all the three kinds of diseases, and each family suffering from a rare disease is also suffering from blood pressure.
So, families suffering from rare disease and blood pressure only = 25 – 10 = 15
Now, as per the Venn diagram,
(40 – x) + x + 10 + 15 + (50 – x) = 100
Or 115 – x = 100
Or x = 115 – 100
Or x = 15
∴ Number of families suffering from blood pressure only = 50 – x = 50 – 15 = 35
Hence, option (c) is the right answer.

54 (d)

P = {3, 6, 9, 12, 15, 18, 21, 24, 27, 30, ……}
Q = {7, 14, 21, 28, 35, 42, 49, ……}
R = {9, 18, 27, 36, 45, 54, 63, ……}
(P∩Q) = {21, 42, 63, ……}
(P∩Q) ∩ R = {63, 126, ……..}
Hence, option (d) is the right answer.

55 (b)

Land allotted to water reservoir, green area and industry = 18 + 108 + 54 = 180°
This is 50% of the total area.
Hence, option (b) is right.

56 (d)

Central angle of land allotted to green area = 108°
Central angle of land allotted to residences = 60 °
∴ Required percent = (108/60) × 100 = 180%
Hence, option (d) is the right answer.

57 (a)

LCM (8, 12) = 24
984 is the largest three-digit number which is divisible by 24.
So, the largest three-digit number which when divided by 24 leaves a remainder of 2 = 984 + 2 = 986
Hence, option (a) is the right answer.

58 (d)

Let Ram can complete the work in x days.
Time taken by Shyam to complete 1/4 of the work = 3x/5 days
Time taken by Shyam to complete the whole work = 4 × 3x/5 = 12x/5 days
∴ Shyam's 1 day work = 5/12x
Ram and Shyam's 1 day work = (1/x) + (5/12x)
∴ (1/x) + (5/12x) = 1/24
Or (1/x) + (5/12x) = 1/24
Or 17/12x = 1/24
Or x = 17 × 24 / 12 = 34
So, Time taken by Shyam to complete the whole work alone = 12x/5 = 12 × 34/5 = 408/5 = 81.6 days
Hence, option (d) is the right answer.

59 (c)

Percentage of guests who took coffee, n(c) = 82%
Percentage of guests who took soft drink, n(s) = 54%
Total percentage of guests in the party = n(s ∪ c) = 100%
So, 100 = 82 + 54 – n (c ∩ s)
Or n(c ∩ s) = 136 – 100 = 36%
Thus, 36% guests took both.
Now, we know that the number of guests that took both = 72
So, 36%→72
Or 100% → (72/36) × 100 = 200
Hence, the total number of guests in the party is 200.
Hence, option (c) is the right answer.

60 (b)

The six digit number is of the form XYXYXY. By using place value method, we get:
XY × 10000 + XY × 100 + XY = 10000XY + 100XY + XY = 10101XY
So, the number XYXYXY will always be divisible by 10101.
Hence, option (b) is the right answer.

61 (c)

We know that,
Unit digit of 6^{25} is 6,
Unit digit of 9^{16} is 1, and
Unit digit of 5^{40} is 5.
Hence, unit digit of $6^{25} + 9^{16} + 5^{40} = 6 + 1 + 5 = 2$.
Hence, option (c) is the right answer.

62 (a)

Assumption 1 is correct. The passage mentions - "*Despite these challenges, India has become stronger and today is looking towards becoming a middle-income country and a major player in global affairs."* These lines support the assumption that the growth of a country can happen, despite the internal security issues. Hence, as per the passage, the given assumption is correct.
Assumption 2 is incorrect. The passage does not mention the act of successfully curbing secessionist tendencies by the government of India. Hence, this assumption is beyond the scope of the passage and is not correct.

63 (c)

Option (a) is incorrect. The passage mentions, "*While there is no room for complacency, the country is confident that despite the complexity, these challenges can be handled through a combination of sound policies and institutional capacity"* which means that policies and institutional capacity together can address the internal security challenges. So, to say that sound policies are more than enough to handle the complex internal security challenges would not be correct.
Option (b) is incorrect. The given statement is not correct because the passage mentions – "*Many of our problems can be traced to the partition. Yet, India has retained its unity and emerged as a strong country",* meaning that many of our problems are due to partition. However, the given statement mentions partition as the root cause of "all" internal security problems which is not correct.
Option (c) is correct. The given statement is correct as per the following lines from the passage - *"**Despite these challenges, India has become stronger** and today is looking towards becoming a middle-income country and a major player in global affairs."* So, the option is correct as per the passage.
Option (d) is incorrect. The passage does not mention anything about the external environment within the context of internal security challenges. Hence, this option is beyond the scope of the passage and is not correct.

64 (b)

Option (a) is incorrect. The passage only mentions, *"The results have uncovered associations between disruptions to the human gut microbiota and many different diseases – including inflammatory bowel disease, cancer, and neurodevelopmental disorders".* Nowhere does it mention gut microbiota to be the major cause of cancer or other given diseases. Hence, this option is not correct as per the information given in the passage.

Option (b) is correct. The following lines from the passage "*But **other experimental approaches are needed to understand** the underlying mechanisms for how interactions between the gut microbiota and the host affect human health and disease*" validate the given option. Hence, this option is the best crux of the passage.

Option (c) is incorrect. The passage only mentions, *"The results have uncovered associations between disruptions to the human gut microbiota and many different diseases – including inflammatory bowel disease, cancer, and neurodevelopmental disorders".* Nowhere does it mention that human gut microbiota gets disturbed due to the different diseases caused in humans. Rather it's the other way round – scientist suspect that due to the disturbance in gut microbiota several diseases may be caused. Moreover, the passage mentions "*But other experimental approaches are needed to understand the underlying mechanisms for how interactions between the gut microbiota and the host affect human health and disease*", which means that more research is required. Hence, this option is not correct as per the passage.

Option (d) is incorrect. The passage mentions "*But other experimental approaches are needed to understand the underlying mechanisms for how interactions between the gut microbiota and the host affect human health and disease.*" There is no linkage, as of now, between restoring gut microbiota and the treatment of the stated diseases. Hence, this option is not the correct crux.

65 (b)

Raju's 1 day's work = (2/5) × (1/6) = 1/15
Sandhya's 1 day's work = (1/3) × (1/10) = 1/30
Combined work of Raju and Sandhya in one day = (1/15) + (1/30) = 1/10
∴ Both of them together can complete the work in 10 days.
So, option (b) is the right answer.

66 (a)

L.C.M. of 9, 15, 18, 25 = 450 seconds
So, after every 450 seconds, i.e. 7.5 minutes, bells will ring together
∵ In 7.5 minutes they will ring together 1 time
∴ In 1 minute they will ring together 1/7.5 times, i.e. 2/15 times
∴ In 60 minutes or 1 hour they will ring together (2/15) × 60 = 8 times
∴ In 4 hours they will ring together 8 × 4 = 32 times
Hence, option (a) is the right answer.

67 (d)

P = {B, L, O, W}
Q = {F, L, O, W}
R = {S, L, O, W}
Hence, option (d) is the right answer.
Note: The symbol "⊆" means "is a subset of". The symbol "⊂" means "is a proper subset of".

68 (a)

Students passed in science exam n(A) = 60%
Students passed in maths exam n(A) = 40%
Students passed in both exams n(A∩B) = 30%
Now, by set theory n(A∪B) = n(A) + n(B) - n(A∩B)
Students who passed in atleast one of the exams, n(A∪B) = n(A) + n(B) - n(A∩B) = 60 + 40 – 30 = 70%
So, those who failed in both exams = 30% = 12000
Or 1% = 400
Or 100% = 40000
∴ Total number of students who appeared in exam = 40000
Hence, option (a) is the right answer.

69 (d)

M = {m, n}
N = {4, 6, 8, 10}
O = {6, 8, 10, 11, 12}
(N ∩ O) = {4, 6, 8, 10} ∩ {6, 8, 10, 11, 12} = {6, 8, 10}
Now, M × (N ∩ O) = {m, n} × {6, 8, 10} = {(m, 6), (m, 8), (m, 10), (n, 6), (n, 8), (n, 10)}
Hence, option (d) is the right answer.

70 (b)

Total number of soldiers = 80
Number of soldiers who have bulletproof jacket = (80 × 20)/100 = 16
Number of soldiers who have helmet only = 50% of remaining = 50% of (80 – 16) = 64/2 = 32
Number of soldiers who have neither bulletproof jacket nor helmet = 80 – 16 – 32 = 80 – 48 = 32
Hence, option (b) is the right answer.

71 (b)

Option (a) is not correct. The central theme of the passage revolves around the marine heat wave in the North Atlantic. The above statement mentions El Nino and its effect on global weather system, which is a part of the central theme of the passage. Also, La Nina has not even been mentioned in the passage. **Hence, it is not a correct option.**
Option (b) is correct. This is the crux of the passage, and the entire passage revolves around this theme. The passage initially mentions that **"An extremely unusual marine heatwave is occurring in the North Atlantic Ocean, especially around the United Kingdom (UK) and Ireland. It has lasted for more than two months and may continue through the rest of the year as well".** Further, the passage revolves around this theme, narrating the cause of marine heatwave and its impact. The passage further says that **"Such warming has never been observed in the region before and could lead to long-lasting impacts on marine flora and fauna, on livelihoods and local weather patterns, and even heatwaves on the land". Hence, it is the correct option.**
Option (c) is not correct. The passage mentions the unusual marine heat wave in North Atlantic, but it does not say that North Europe is the most affected region due to heatwaves. **Hence, it is not a correct option.**
Option (d) is not correct. The issue of increasing marine traffic has not been discussed in the passage. **Hence, it is not a correct option.**

72 (b)

Option (a) is incorrect. The given statement is extreme because it states that those businesses which make a profit are not ethical. However, the passage states that "… *Mahatma Gandhi once mentioned that all businesses have a social responsibility which has nothing to do with their ordinary economic activity."* which means that social responsibility is not related to profit-making, nor is profit-making a bad thing per se. Therefore, this is not what the passage implies.
Option (b) is correct. The lines, "*While referring to business activities, Mahatma Gandhi once mentioned that all businesses have a social responsibility which has nothing to do with their ordinary economic activity."* and "*Therefore, the responsibility towards society is a moral obligation arising out of business ethics, which in turn is steeped in the philosophy of business*" reflect that social responsibility is a moral obligation which is a part of the philosophy of business. Hence, this option best reflects what the passage implies.
Option (c) is incorrect. The given option is not what the passage implies because the context of every person being socially responsible is not a part of the passage. The passage is limited to the context of businesses being socially responsible. Hence, this option is not correct.
Option (d) is incorrect. The given statement is not correct because of the lines - *"While referring to business activities, Mahatma Gandhi once mentioned that* ***all businesses have a social responsibility which has nothing to do with their ordinary economic activity.****"* Though it's correct that without profit, it would be hard for a business to contribute to the society. However, such loss-making or non-profit making businesses have not been discussed in the passage separately.

73 (a)

Option (a) is correct. The given option best captures the essence of the passage as given in lines, "*By examining your past (and present) behaviours, beliefs, values, and actions, you will start to see a pattern – aka dots connecting. Based on this intelligence that you have gathered about the things you hold most dear – both personally and professionally – you can start to chart your dots for future action".* Therefore, this option is the best crux of the passage.

Option (b) is incorrect. The given option is merely an explanation of the meaning of dots in the context of life. However, the passage is focusing on the importance of connecting the dots and using them to move forward in life.

Option (c) is incorrect. The given option is not correct because the focus of the writer is not just on becoming emotionally intelligent or self-aware, but to use that intelligence to move forward in life. Thus, the writer is more action-oriented than just being an arm-chair philosopher, which is evident in these lines – "*Based on this intelligence that you have gathered about the things you hold most dear – both personally and professionally – you can start to chart your dots for future action*." Moreover, the concept of Emotional Intelligence has not been mentioned or defined in the passage. Therefore, this option is not the best crux of the passage.

Option (d) is incorrect. The given option is not correct as it talks about challenging our beliefs, values, and actions to move forward. However, this is not a part of the passage. The passage focuses on analysing our beliefs, values, and actions to learn from them and move forward. Hence, the given option is not the best crux of the passage.

74 (a)

Option (a) is correct. The following lines from the passage, *"A* ***good leader with a stress-free mind*** *can easily spot any signs of trouble in his team, and quickly and effectively solve these issues as they arise. Since the techniques used in managing stress are also* ***very beneficial to creating emotional management when used now, the mind of the leader can immediately become clear to handle any challenges in the workplace****."* validate the assertion made in the passage. So, this option is the best crux of the passage.

Option (b) is incorrect. The passage mentions the importance of handling or managing stress by a leader as given in the lines, *"Since the techniques used in managing stress are also very beneficial to creating emotional management, when used now, the mind of the leader can immediately become clear to handle any challenges in the workplace."* However, this option mentions the quality of understanding the emotions of self and others, that too in a corporate setting. Hence, the given option is not correct.

Option (c) is incorrect. The context of intrinsic abilities of a good leader is not a part of the passage, and is beyond its scope. Hence, the given option is not correct.

Option (d) is incorrect. The given option is not correct because it mentions that a good leader does not face any stress in managing his team and in maintaining his own productivity. However, the passage is about managing stress efficiently. Therefore, this crux is not correct, as it is contradictory to the central theme of the passage.

75 (b)

Let the total number of boys be x.
Then, (¾) x = 18
Or x = 24
If the total number of students is y, then
(2/3) y = 24
Or y = 36
So, Number of girls in the class = y – x = 36 – 24 = 12
Hence option (b) is the right answer.

76 (b)

Let the total number of pages in the book be 'n'.
Let page number 'x' be repeated.
Then, $x + \sum_{i=1}^{n} i = 850$
$\Rightarrow x + (n(n+1))/2 = 850$
So, $(n(n+1))/2 \leq 850$
$\Rightarrow n^2 + n \leq 1700$

The greatest possible value of n = 40.
Now, for n = 40, $n(n+1)/2 = (40 \times 41)/2 = 820$
So, x = 30.
Hence option (b) is the right answer.

77 (b)

Laxman's work efficiency = 1/6
Suresh's work efficiency = 1/12
So, ratio of the work efficiencies of Laxman and Suresh = 2:1
∴ Part of the work done by Laxman = 2/(2 + 1) = 2/3
So, option (b) is the right answer.

78 (c)

To maximize the number of incorrect responses, the number of correct responses should also be maximized.
Let the number of correct responses (maximum) be 'x'.
So, the number of incorrect responses (maximum) = 80 – x.
So, total marks scored = 3x – (80 – x).
Now, $3x - (80 - x) > 150$
$\Rightarrow 4x - 80 > 150$
$\Rightarrow 4x > 230$
$\Rightarrow x > 57.5$
So, the least possible value of x = 58.
Hence, the maximum number of incorrect responses = 80 – 58 = 22.
So, option (c) is the right answer.

79 (b)

Option (a) is incorrect. The context of the cost of development is not a part of the passage. The passage does not mention the cost being high or low. Hence, this option is beyond the scope of the passage and is not correct as per the passage.
Option (b) is correct. The whole passage is about how biomimicry will help in the production of environment-friendly and sustainable products as seen in the lines, *"Researchers are studying how plants store energy, to help design better solar panels. Biomimicry principles are used to produce more energy-efficient trains and cars and to help manufacturing plants create products that use less energy and produce little or no waste*". Hence, this option best reflects what the passage implies.
Option (c) is incorrect. Though the passage lists a lot of the benefits of biomimicry, it would be rather extreme to say that it can soon phase out fossil fuels. So, this option is not what the passage implies.
Option (d) is incorrect. The issue of biomimicry being unaffordable has not been discussed in the passage. So, this option is not what the passage implies.

80 (b)

Option (a) is incorrect. The passage is just describing the issues with overuse of technology. It's not proving any solutions. Also, the issue of work-life balance has not been discussed in the passage as such.
Option (b) is correct. The passage talks about the increasing role of technology in our lives, how it offers benefits but also brings some drawbacks, particularly in relation to mental health. The author states that being constantly connected through technology can lead to psychological issues like stress, anxiety, and depression. This gives an overall sense of a mixed view of technology, which is best reflected in this statement - "Use of technology gives pleasure, but it also takes a toll on mental health."
Option (c) is incorrect. The given option is not correct because it states that we should be restricted to use social media only for a few hours. It has nowhere been suggested by the author.
Option (d) is incorrect. The given statement is opposite to the truth – "Technology in the form of social media is a good servant but a bad master", which metaphorically means that technology is useful when it is controlled, but can be harmful when it dominates our lives.