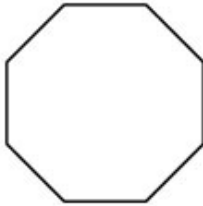## ANSWERS & EXPLANATION

APTITUDE TEST–Test (4299) – 2024

1 (a)

An octagon as eight sides therefore an octagonal path will have eight sides, as shown below:

Since the sides of octagon are of 30 metres each. Therefore, total distance $= 8 \times 30 = 240$ m

Since person moves with alternating speeds of 60 m/s and 15 m/s for alternating sides of the octagonal path therefore for 4 sides he will have speed of 60 m/s and for another 4 sides he will have speed of 15 m/s.

Therefore, Total time $= 4(30/60 + 30/15) = 4 (0.5+2) = 4 \times 2.5 = 10$ s

Now, Average speed $=$ (Total distance)/(Total time)

So, average speed per round of the path $=$ (240 m)/(10 s) $= 24$ m/s.

Hence, option (a) is correct.

2 (d)

We will check each option one by one.

Option (a):

Let $x = -2$ and $y = 2$

$x^3 + y^6 = (-2)^3 + (2)^6 = -8 + 64 = 56$

$x^3 + y^6$ is positive, but x is negative.

Hence, option (a) is not correct.

Option (b):

Let $x = 2$ and $y = 1$

$|x^3| = |2^3| = 8$

$|y^6| = |1^6| = 1$

Thus, $|x^3|$ is greater than $|y^6|$.

Hence, option (b) is not correct.

Option (c):

Let $x = 1$ and $y = 1$

$x^3 + y^6 = (1)^3 + (1)^6 = 2$

$x^3 + y^6$ is positive and x^3 is also positive.

Hence, option (c) is not correct.

Option (d):

$(x + y^2) (x^2 + y^4 - xy^2)$

$= x^3 + xy^4 - x^2y^2 + x^2y^2 + y^6 - xy^4$

$= x^3 + y^6$

Thus, the product of $(x + y^2)$ and $(x^2 + y^4 - xy^2)$ is $x^3 + y^6$

Since, $x^3 + y^6$ is positive, $(x + y^2)$ and $(x^2 + y^4 - xy^2)$ must have the same sign - they must either be both positive or both negative.

Hence, option (d) is correct.

3 (a)

Let the quantity of milk in the original mixture be x kg.
As the mixture contains 5 parts of milk and 1 part of water, so the quantity of water in the original mixture = x/5 kg.
Now on adding 2 kg of water, the ratio of milk and water = 4:1.
So, $x/((x/5+2)) = 4/1$
$\Rightarrow x = 4x/5 + 8$
$\Rightarrow x = 40$ kg
Hence, option (a) is correct.

4 (c)

Assumption 1 is correct: The passage emphasizes the cultural and emotional aspects of food consumption, suggesting that our choices and interactions with food are not purely driven by survival instincts. The passage goes beyond simply stating that food satisfies hunger, highlighting its social, emotional, and psychological significance as seen in the lines *"People take special care in planning and cooking food for social occasions, so **food promotes a sense of community**. In addition to social functions food also satisfy our emotional needs."* This suggests the author believes food transcends its nutritional value, and is deeply intertwined with our well-being in broader ways. **Hence, assumption 1 is correct.**
Assumption 2 is correct: Preparing and sharing food involves collaboration, cooperation, and oftentimes shared responsibilities. This collaborative process can foster feelings of unity and belongingness, contributing to a sense of community. Taking time and effort to plan and cook food for others can be perceived as a gesture of care, love, and attention. This expression of positive emotions can strengthen social bonds and contribute to a sense of community spirit. **Hence, assumption 2 is correct.**

5 (a)

Inference 1 is correct: While the 2001 report focuses on technology, the 2002 report shifts attention to the critical role of politics in shaping progress. This highlights the need for a holistic approach to human development that integrates technological advancements with robust political institutions. **Hence, inference 1 is correct.**
Inference 2 is not correct: This inference is irrelevant because the passage emphasizes the complex interplay between various factors like technology, politics, poverty, and strong institutions. Technological progress alone cannot guarantee human development in the absence of strong political systems as per 2002 and 2003 reports. **Hence, inference 2 is not correct.**

6 (b)

Option (a) is not correct: The passage says that *"Development is accepted as the secular and rational way of conducting the affairs of the state in the general good, irrespective of the differences of gender, class, colour, caste and creed".* The passage is not about acceptance or rejection of the concept of development in the past. It cannot be implied that development was universally accepted or not in the past as the passage does not mention this explicitly. **Hence, option (a) is not correct.**
Option (b) is correct: Development is discussed in the passage, which everyone finds exciting because it seems like it will improve things. It's comparable to a magic spell that can solve issues with industries, agriculture, travel, health, and even space exploration! The belief is that development is the most equitable means for the state to provide for the needs of all citizens, regardless of their background or identity. It is viewed as the answer to all the negative things that have transpired in the past, such as injustice and pain. So, the main idea is that development is a powerful tool, to make things better for everyone. **Hence, option (b) is correct.**
Option (c) is not correct: The passage says, *"Development is valorized as the panacea for all our social evils".* In light of this quoted line, the above statement seems to be relevant, but it cannot be considered as the most logical and crucial message of the passage. The passage does cover a wider aspect of development, but it does not touch upon the ecological consequences. **Hence, option (c) is not correct.**

7 (a)

Let the average age of the newly admitted 15 students be x years.
So, Total age of 15 newly admitted students = 15x
Since given average age of existing 60 students = 20
 Therefore, Total age of the existing 60 students = 60×20

Hence, total age of the 75 students = 60×20 + 15x
Since average after admission of new students increases by 0.4 years. So new average = 20.4 years
So, 60×20 + 15x = 75×20.4
Or 1200 + 15x = 1530
Or 15x = 1530-1200
Or 15x = 330
Or x = 330/15
Or x = 22 years
Hence, option (a) is correct.

8 (a)

The sum of all the possible 4-digit odd natural numbers of the form 'xxyy' is:
(2211 + 2233 + 2255 + 2277 + 2299) + (3311 + 3333 + 3355 +3377 + 3399) + (4411 + 4433 + 4455 + 4477 + 4499) + (5511 + 5533 + 5555 + 5577 + 5599) + (6611 + 6633 + 6655 + 6677 + 6699) + (7711 + 7733 + 7755 + 7777 + 7799) + (8811 + ……..+ 8899) + (9911 + ……. + 9999)
= 5(2200 + 3300 + 4400 + 5500 + 6600 + 7700 + 8800 + 9900) + 8(11 + 33 + 55 + 77 + 99)
= 5×48400 + 2200
Required average = (5×48400 + 2200)/40 = 6105
Hence, option (a) is correct.

9 (d)

Let the speeds of P and Q be 3x and 4x respectively.
Distance covered by P to win the race = 500 – 140 = 360 m
Time taken by P, t = 360/3x = 120/x
So, xt = 120
Distance covered by Q = 4x × t = 4×120 = 480 m   (since, xt = 120)
So, the distance between P and Q when P wins the race = 500 – 480 = 20 m.
Hence, option (d) is correct.

10 (b)

$x^3 – 4x = x(x^2 – 4) = x(x^2-2^2) = (x – 2)x(x + 2)$
Note: $a^2-b^2 = (a-b)(a+b)$
It is a product of three consecutive odd/even integers.
If x is odd, then $(x – 2)x(x + 2)$ will be divisible by 3.
From Statement 1:
When 5x is divided by 2, there is a remainder. It means 5x is not completely divisible by 2. This implies that x is odd.
Therefore, $(x – 2)x(x + 2)$ is divisible by 3.
Thus, Statement 1 alone is sufficient.
From Statement 2:
x = 6y + 1, where y is an integer.
x = even + odd = odd
Therefore, $(x – 2)x(x + 2)$ is divisible by 3.
Thus, Statement 2 alone is also sufficient.
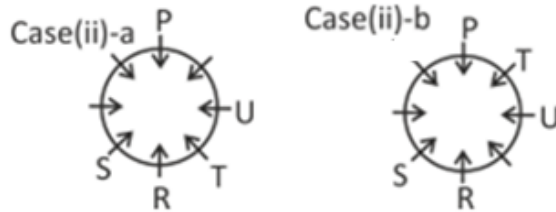Hence, the Question can be answered by using either Statement alone.
Hence, option (b) is correct.

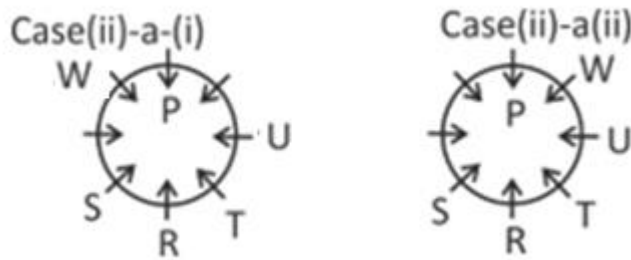## Explanation for Questions numbers 11 & 12:

R is the neighbour of S and 4th to the left of P. We get following two possibilities:

U is the neighbour of T and 3rd to the right of S. This information eliminates Case (i).
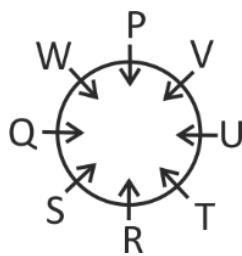
Case(ii)-a P   Case(ii)-b P

P is the neighbour of W but not of T. This information eliminates Case (ii)-b.

Case(ii)-a-(i)   Case(ii)-a(ii)

V is neither the neighbour of W nor of Q. This information eliminates Case (ii)-a (ii).
Final sitting arrangement:

11 (c)

12 (d)

13 (b)

We are concerned with the solid part of the fruit.
Assume that x kg of fresh fruit is required to get 60 kg of dry fruit.
Solid part in the fresh fruit = Solid part in the dry fruit
$\Rightarrow$ (100-70) % of x = (100-25) % of 60
(Given that fresh fruit contains 70% water and dry fruit contains 25% water)
$\Rightarrow$ 30% of x = 75% of 60
$\Rightarrow (30 \times x)/100 = (75 \times 60)/100$
$\Rightarrow 30 \times x = 75 \times 60$
$\Rightarrow x = 150$ kg
Hence, option (b) is correct.

14 (d)

From Statement 1:
We cannot determine the answer as we do not know whether Netherland scored any goals or not.
From Statement 2:
We cannot determine the answer as the data is again insufficient.
From Statement 1 & 2:
If Netherland was leading 2-0, the match would be a draw. If Netherland was leading 3-1 Brazil would win. Hence, we cannot say for sure whether Brazil won the match or not.
Hence, the Question cannot be answered even by using both the Statements together.
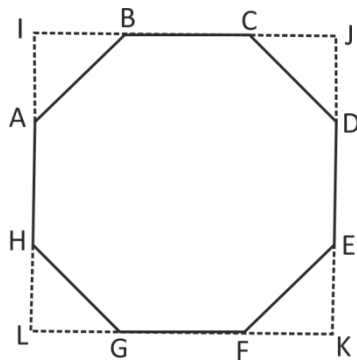Hence, option (d) is correct.

15 (d)

The number of distinct areas into which the plane can be divided will differ depending on the number of lines drawn.
Hence, option (d) is correct.

16 (c)

Let AI = x, So BI = x
Triangle AIB is a right-angled triangle. Therefore, $AB^2 = AI^2 + BI^2$
Or $AB = (x^2 + x^2)^{1/2} = x\sqrt{2}$
Since the final figure has all sides equal, so, $AH = x\sqrt{2}$
Now, AI + AH + HL = 4
Or $x + x\sqrt{2} + x = 4$
Or $(2x + \sqrt{2}x) = 4$
Or $x[2 + \sqrt{2}] = 4$
Or $x = 4/[2 + \sqrt{2}] = 2(2 - \sqrt{2})$ m
Side of octagon = $x\sqrt{2} = \sqrt{2} \times 2(2 - \sqrt{2}) = 4(\sqrt{2} - 1)$ m
Area of regular octagon = $2(\sqrt{2} + 1) \times side^2 = 2(\sqrt{2} + 1) \times 4(\sqrt{2} - 1) = 8$ m^2
Hence, option (c) is correct.

17 (c)

Inference 1 is correct: The passage says, *"Migrants to town initially earn less than observationally equivalent natives, but the evidence indicates that this gap disappears within a few years and may even reverse".* This suggests that the earnings gap between migrants and natives tends to disappear within a few years, and may even reverse, suggesting that migrants can catch up to or surpass natives in terms of earnings over time. **Hence, the income gap keep changing its pattern, and is not etched in stone.**
Inference 2 is correct: The passage says, *"One way that families may insure themselves is by having members migrate to locations where times of economic adversity do not normally coincide with those at home".* This implies that even if there occurs a financial turmoil in the home location, the migrant location can still provide financial support. This reflects that migration can work as a risk safety net. **Hence, inference 2 is correct.**

18 (d)

Option (a) is not correct: The passage mentions that **"*The development of nuclear technology and infrastructure that is capable of producing a nuclear weapon is a technical dimension of the problem of proliferation".*** It does not say that infrastructure for the development of nuclear technology is becoming easily accessible. **Hence, option (a) is not correct.**
Option (b) is not correct: The passage says, **"*The capability of a state to go nuclear is dependent on the technical component".*** The given statement is correct in the context of the passage, but it cannot be considered the most logical and rational message as the passage addresses the broader theme of peaceful nuclear technology vs. devastation potential. **Hence, option (b) is not correct.**
Option (c) is not correct: Focusing solely on the peaceful vs. military distinction underestimates the complex dangers of nuclear proliferation. The line between peaceful and military applications is often blurred and difficult to monitor effectively. States with peaceful intentions can be drawn into a nuclear arms race due to geopolitical pressures or perceived security threats. There is no discussion on the neat separation of both in the passage. **Hence, option (c) is not correct.**

Option (d) is correct: The passage emphasizes the urgency of effective non-proliferation measures to mitigate the existential threat posed by the misuse of nuclear power. The passage says, "The debate is not so much about the use of nuclear technology, *for the uses of nuclear technology in the development process of any nation has been well accepted. The debate is on the peaceful vs. the military uses of this technology".* The passage revolves around the theme of the dual use of nuclear technology. **Hence, option (d) is correct.**

19 (a)

Option (a) is correct: The passage argues that democracy requires empowering individuals through recognized and enforceable rights. Rights are not mere gifts from the state, but inherent claims that help individuals flourish and are necessary for the true government-of-the-people. The passage says, *"States never give rights, they only recognize them; governments never grant rights, they only protect them".* The state's role is not to grant rights but to recognize and protect those already existing in society. These rights are inherent claims born from social needs and protected by the state. Only then can democracy truly serve the people it is supposed to represent. **Hence, option (a) is correct.**

Option (b) is not correct: While the passage mentions how rights benefit individuals, it doesn't specifically claim they exist solely for the government's gain. It emphasizes the origin of rights in society and their role as checks against misuse of state power. The tone of the passage is clearly in favour of public wellbeing. Therefore, we cannot say that rights exist to ultimately serve government interests. **Hence, option (b) is not correct.**

Option (c) is not correct: The passage acknowledges the emergence of a formalized rights framework in the 15th-16th centuries, but it doesn't suggest that the earlier societies lacked valuable claims for individual well-being. **Hence, option (c) is not correct.**

Option (d) is not correct: While stronger enforcement is undoubtedly crucial for securing rights, this answer option oversimplifies the issue. The passage emphasizes the interplay between recognition, enforcement, and societal acceptance as factors that contribute to the strength and effectiveness of rights framework. The passage does not necessarily correlate stronger enforcement with stronger rights. A strong enforcement of weak provisions of right may not lead to true public welfare. Also, there's no discussion on ethnic and cultural rights in the passage as such. **Hence, option (d) is not correct.**

20 (c)

$4^{3333} \times 5^{6666}$
$= 2^{6666} \times 5^{6666}$
$= (2 \times 5)^{6666}$
$= 10^{6666}$.
Hence the number of digits will be 6667 (6666 zeroes and 1 one).
Thus, option (c) is correct.

21 (b)

M had Rs. 80 more than P.
$M - P = 80$ …………… (i)
Q and O together had Rs. 370.
$Q + O = 370$ ………. (ii)
N had Rs. 80 more than Q.
$N - 80 = Q$ ………. (iii)
M had Rs. 50 more than Q.
$M - 50 = Q$ ……. (iv)
M and P together had Rs. 400.
$M + P = 400$ ….. (v)
From equations (i) and (v), we get:
$M = 240, P = 160$ ….. (vi)
From equations (iv) and (vi), we get:
$Q = M - 50 = 240 - 50 = 190$ ……(vii)
From equations (iii) and (vii), we get:
$N = Q + 80 = 190 + 80 = 270$ ….. (viii)
From equations (ii) and (viii), we get:
$O = 370 - Q = 370 - 190 = 180$

Thus, Q had Rs. 10 more than O. Thus, statement 1 is incorrect.

N had Rs. 30 more than M. Thus, statement 2 is correct.

N and Q together had Rs. 270 + 190 = Rs. 460. Thus, statement 3 is correct.

Thus, option (b) is correct.

22 (c)

The 2888-digit number:

1 2 3 4 5 6 7 8 9 10 11 12 13 _ _ _ _ 998 999

By the rules of divisibility, we know that any number is divisible 16, if the last four digits of the number are divisible by 16.

In the given number, the last four digits are 8999. If 8999 is divided by 16, it will leave a remainder of 7.

Hence, option (c) is correct.

23 (d)

Given: E < F, B > A, A < D < B

From Statement 1:

As B>D, A must be greater than E.

Arrangement:

E < A < D < B and E < F

Thus, Statement 1 alone is not sufficient.

No information is given about C in Statement 2. Thus, it is also not sufficient.

Even by using statements 1 and 2 together, we are not able to find who is the shortest.

Thus, the Question cannot be answered even by using both the Statements together.

Hence, option (d) is correct.

24 (d)

Total marks of the three exams = 800×3 = 2400

Total marks secured in the three exams = 75% of 2400 = 1800

Marks secured in the first exam = 59.5% of 800 = 476

Marks secured in the second exam = 68% of 800 = 544

Thus, marks secured in the third exam = 1800 – (476 + 544) = 780

Hence, option (d) is correct.

25 (a)

First, we calculate the total number of days from 1st July to 21 December.

Days left in July = 31-1 = 30; August= 31; September= 30; October= 31; November= 30; December= 21.

So, the total days= 30 + 31 + 30 + 31+ 30 +21 = 173.

Odd days in 173 days = 173/7 = 5 (Remainder).

So, subtract 5 days from the given day of 21st December, because we are going backward from December to July.

So, 1st July will be Friday -5 days, i.e. Sunday.

Hence, option (a) is correct.

26 (a)

Inference 1 is correct: The passage emphasizes that India has never been defined by a single language, culture, or political power. Instead, it thrives on a rich tapestry of local, regional, and national influences. The passage says, *"They all have their identities within the structure of homogeneous living. This nature of plurality itself is integral to Indianness".* This suggests that Indian identity is not monolithic, but rather a dynamic and inclusive mosaic of diverse experiences and perspectives. **Hence, inference 1 is correct.**

Inference 2 is not correct: While the passage rightfully emphasizes India's historical and cultural acceptance of multiple languages, religions, and regional identities, it is important to acknowledge that navigating such diversity presents complex challenges. The passage says, *"India was never ruled by one royal power historically except in times of Ashoka or under the British. Several royal families ruled their territories at the same time. They all ruled their domains but looked for an opportunity to overpower the other."* Thus, it is amply clear that though there was diversity, there was a chance of conflict also. Hence, it would be incorrect to say that harmony and unity were automatically ensured.

27 (a)

Assumption 1 is correct: The passage says, ***"The first and foremost aid to agricultural development is information. Due to lack of information on prices and markets, farmers in agriculturally backward areas suffer from exploitation by middlemen and local traders".*** This suggests that despite better infrastructure, farmers face challenges due to information asymmetries. Addressing access to market data, pricing information, and agricultural best practices could significantly benefit rural communities. **Hence, assumption 1 is correct.**

Statement 2 is not correct: While the passage highlights the importance of haats for the "rural poor", it doesn't necessarily imply a complete absence of alternative avenues for trade and commerce. **Hence, assumption 2 is not correct.**

28 (d)

5 days earlier to Monday, i.e. Monday – 5 = Wednesday.
So, the sister's marriage day was Wednesday.
Now, extra days in 136 days (apart from multiple of 7) = 136/7 = 3 (Remainder).
So, the day Roy will travel to Allahabad = Wednesday + 3 = Saturday
Hence, option (d) is correct.

29 (d)

Let the required number be x.
So, (5-x) : (9-x) = (9-x) : (17-x)
or (5-x)/(9-x) = (9-x)/(17-x)
or (9-x)^2 = (5-x) (17-x)
or x=1
Hence, option (d) is correct.

30 (c)

Let the present age of B be 16x years.
Then, present age of A = (5/8)16x = 10x years
And, present age of C = 13x years
According to the question,
(16x + 10x + 13x)/3 = 52
Or 13x = 52
Or x = 4
Required sum = (16x + 10x + 13x) – 15 = 39x – 15 = 39×4 – 15 = 141 years
Hence, option (c) is correct.

31 (b)

Suppose that the object P will cost 60 paise more than the object Q after x years. Then,
(630 + 60x) − (945 + 22.5x) = 60
Or 37.5x = 375
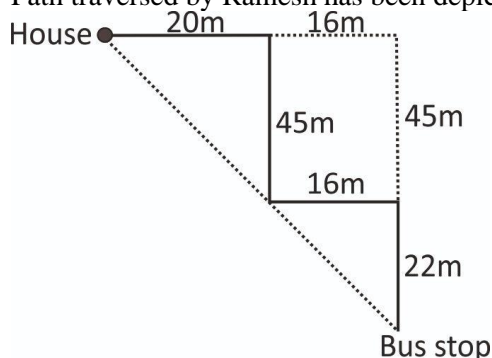Or x = 10.
Hence, the object P will cost 60 paise more than the object Q, 10 years after 2011 i.e. in the year 2021.
Hence, option (b) is correct.

32 (a)

Path traversed by Ramesh has been depicted below:

Shortest distance between Ramesh's house and bus stop = $[(20 + 16)^2 + (45 + 22)^2]^{1/2} = (5785)^{1/2} = 76$ m

Thus, Ramesh is in Southeast direction from his house and the shortest distance between his house and bus stop is 76 m.

Hence, option (a) is correct.

33 (b)

$9450 = 2^1 \times 3^3 \times 5^2 \times 7^1$

Sum of the factors of any number N = $[(X^{a+1}-1)/X-1] \times [(Y^{b+1}-1)/Y-1] \times [(Z^{c+1}-1)/Z-1]$, where X, Y and Z are prime numbers and a, b and c are their respective powers.

The sum of all the factors of $9450 = [2^{1 + 1} - 1] \times [3^{3 + 1} - 1] \times [5^{2 + 1} - 1] \times [7^{1 + 1} - 1]/[(2 - 1)(3 - 1)(5 - 1)(7 - 1)] = (3 \times 80 \times 124 \times 48)/(1 \times 2 \times 4 \times 6) = 29760$

Hence, option (b) is correct.

34 (c)

Let the number of members in the association = X.

Also, contribution of each member = Rs. X.

President's contribution was 10 more than that of the other members.

So, total collection of funds from all the members = $X^2 + 10$ which is equivalent to 635 as given in the question.

So, $X^2 + 10 = 635$

Clearly, X =25 satisfies the above equation.

Thus, the number of members in the group excluding the president = 24.

Hence, option (c) is the correct answer.

Explanation for Question no. 35 & 36:

Information regarding cars given in the question: F likes Hyundai. A likes Mahendra. E likes Renault. B does not like Honda or Toyota. C does not like Toyota.

Person	Car
F	Hyundai
A	Mahendra
E	Renault
B	×(Honda or Toyota)
C	×Toyota
D	

B does not like Honda or Toyota. Thus, he likes Tata.

C does not like Toyota. Thus, D likes Toyota, and C likes Honda.

Final Arrangement:

Person	Car
F	Hyundai
A	Mahendra
E	Renault
B	Tata
C	Honda
D	Toyota

Information regarding blood relations given in the question: B is the father of A. F is the sister of A. E is the mother-in-law of D, who is the wife of C.

Family tree:
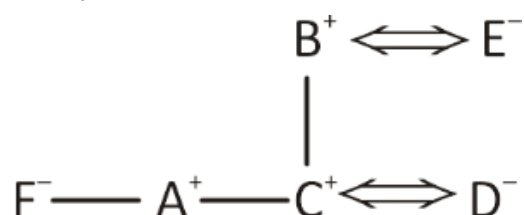
35 (a)

A is the son of E.

36 (d)

D is the daughter-in-law of B, who likes Tata.

37 (d)

Option (a) is not correct: While the passage emphasizes the historical record-breaking nature of the heatwave, it doesn't definitively predict that every October month is now hot. It highlights the trend of increasing temperatures, but doesn't necessarily imply that October heat is a normal phenomenon. **Hence, option (a) is not correct.**

Option (b) is not correct: The passage mentions that Madagascar is facing the heat wave challenge, which is worrying the locals. It does not mention that heat waves are challenging local governance. **Hence, option (b) is not correct.**

Option (c) is not correct: While the passage mentions the impact caused by the heat wave of Madagascar on local people; it does not correlate heat wave with the depletion of biodiversity. Although, as mentioned in the first part of the passage, Madagascar is known for its biodiversity, but there is no correlation drawn between heat waves and the depletion of biodiversity. **Hence, option (c) is not correct.**

Option (d) is correct: The author highlights that the country had its hottest October on record, with temperatures more than 2.5°C above average. This heat wave is occurring much earlier than usual, causing concern among the locals. The author cites a study conducted by the World Weather Attribution, which further supports the evidence of climate change in Madagascar. **Hence, option (d) is correct.**

38 (a)

Statement 1 is correct: The passage says, "*The effects of the division of labour, in the general business of society, will be more easily understood by considering in what manner it operates in some particular manufactures*". Continuing the above argument, the passage further says, **"…but in those trifling manufactures which are destined to supply the small wants of but a small number of people".** Because all workers in smaller industries can be seen in the same place, it is easier to understand how different tasks are specialized and how they contribute to the final product. **Hence, statement 1 is correct.**

Statement 2 is not correct: This inference is irrelevant because the passage only discusses the visibility of the division of labour, not the skill or efficiency of the workers. It is possible that the workers in smaller industries may be just as skilled as those in larger ones. **Hence, statement 2 is not correct.**

39 (b)

Statement 1 is not correct: The given passage mentions the process of fieldwork in the lines "*Unlike other methods of primary data collection like surveys or interviews, fieldwork involves a long period of interaction with the subjects of research.*" It merely explains what the fieldwork is and how it is different from other approaches. However, it does not compare different approaches in the context of a comprehensive understanding of a community as stated in this answer option. **Hence, statement 1 is not correct.**

Statement 2 is correct: Participant observation seeks to provide a comprehensive insight into a community's complete social fabric, rather than focusing only on answering certain study questions. The passage says, "*Although the sociologist or anthropologist usually has specific areas of interest, the overall goal of 'participant observation' fieldwork is to learn about the 'whole way of life' of a community".* This suggests that the method is focused on gaining a broad understanding of a community's social, cultural, and economic dynamics. **Hence, statement 2 is correct.**

40 (c)

Assumption 1 is correct: The passage mentions "*The contemporary hype about civil society has been caused by the break-up of the socialist regimes in Russia and Eastern Europe and the revival of the Tocquevillian tradition of celebrating associational pluralism in the U.S.".* It suggests that the author views the recent hype as based more on political and ideological factors, rather than being an organic event. Hence, assumption 1 is valid.

Assumption 2 is correct: In the context of the passage, every individual can pursue his interests or freely associate. It's evident in the lines – "*… wherein the rights-bearing individuals are free to pursue their private interests in free association with others*." Hence, assumption 2 is correct.

41 (c)

Here, @ ⇒ =, * ⇒ ≥, # ⇒ >, £ ⇒ <, $ ⇒ ≤

Then, P ≤ R, S ≤ Q, R = Q

On combining, we get:

P ≤ R = Q ≥ S

Conclusion I: S ≥ P → (×)

Conclusion II: S < P → (×)

Hence, option (c) is the correct answer.

42 (d)

Let the number of balls and boxes with the boy be x and y respectively.

If the boy fills in all the boxes with one ball each, he is left with one ball, i.e. the number of balls is one more than the number of boxes.

So, x = y + 1   .... (1)

If the boy fills two balls in one box, one box is left empty.

Accordingly, we have, 2(y-1) = x   ....(2)

Substituting value of x from (1) in (2) we get,

2y – 2 = y +1

So, y = 3

And x = y + 1 = 4.

Hence, option (d) is the correct answer.

Note: We can also solve this question using the various options and checking for the option that satisfies the given conditions.

43 (d)

Total of first three = 60.

Total of last three = 75.

Runs scored by the second and third batsmen = Total of last three – Runs scored by last batsman = 75 – 30 = 45.

So, Runs scored by first batsman = 60 – 45 = 15.

Hence, option (d) is correct.

44 (d)

Let the lengths of the longest, the shortest and the third piece be l, s and m respectively.

Longest piece is five times as long as the shortest piece and the third piece is 30 cm longer than the shortest piece.

So, l = 5s

And, m = s + 30

Length of string = 100 cm

So, l + m + s = 100

⇒ 100 = 5s + s + 30 + s

⇒ 70 = 7s

⇒ s = 10 cm

So, l = 50 cm, m = s + 30 = 10 + 30 = 40 cm and s = 10 cm

So, sides of the triangle are 10 cm, 40 cm, 50 cm

Condition for formation of any triangle is that the sum of any two sides of a triangle is always greater than the third side. Here, sum of two sides of the triangle is not greater than the third side. So, a triangle can't be formed.

Hence, option (d) is correct.

45 (a)

Let the number of steps on the escalator be x.

By the time A covered 30 steps, the escalator moves (x – 30) steps.

Hence, the ratio of the speeds of A and escalator = 30 : (x – 30)

By the time B covered 25 steps, the escalator moves (x – 25) steps.

Hence, the ratio of the speeds of B and escalator = 25 : (x – 25)

Ratio of the speeds of A and B = [30/(x – 30)]/[25/(x – 25)] = 5/4

Or 4[30/(x – 30)] = 5[25/(x – 25)]
Or 24(x – 25) = 25(x – 30)
Or 24x – 24×25 = 25x – 750
Or x = 750 – 600
Or x = 150
Hence, the escalator has 150 steps.
Hence, option (a) is correct.

46 (c)

Only from Statement 1 or only from Statement 2 we cannot answer the question about how many students are playing football.
But if we use both, we have all the information we need to solve this question.
Thus, the Question can be answered by using both the Statements together.
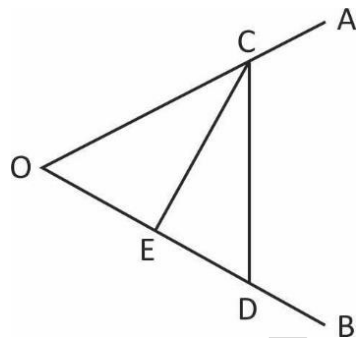Hence, option (c) is correct.

47 (d)

We have no information via either of the two statements about the time difference between Delhi and Alaska.
Thus, the Question cannot be answered even by using both the Statements together.
Hence, option (d) is correct.

48 (b)

In the given figure, OE = EC = CD and angle DCA = 105º
Let angle COE = angle OCE = x (∵ OE = EC)
(If two sides of a triangle are equal, then angles opposite to them are also equal.)
Then ∠CED = ∠COE + ∠OCE = x + x = 2 x
{Sum of two interior angles of a triangle is equal to opposite exterior angle}
∠CDE = ∠CED = 2x (∵ CE = CD)
∠COD + ∠CDO = ∠DCA = 105⁰ {Sum of two interior angles of a triangle is equal to the opposite exterior angle}
or x + 2x = 105º
or 3x = 105º
or x = 105⁰/3 = 35º
Now, ∠CDE = 2x = 2 × 35º = 70º
Hence, option (b) is the correct answer.

49 (d)

Statement 1 is not correct: The passage acknowledges the difficulty of achieving unanimity in a democracy in the lines "*It has been argued that unanimity is generally impossible to achieve when collectivity attempts to arrive at a commonly agreed-upon decision.*" But, it doesn't suggest that this makes democracy inefficient or impractical. It emphasizes the value of considering everyone's interests and ensuring equal binding decisions, regardless of achieving complete agreement. Hence, statement 1 is not correct.
Statement 2 is not correct: The statement is irrelevant as it is not based on the passage. The principle of majority rule need not always be fair, valid and sacrosanct as it ignores the interests of the minority. Hence, statement 2 is not correct.

50 (d)

Assumption 1 is not correct: The passage says, *"With the advent of modernity and nationalism, a process of bourgeois class formation took place transcending the barriers of caste, religion, and tribe."* This is contrary to what the statement states. Hence, assumption 1 is incorrect.

Assumption 2 is not correct: The passage mentions *"Through the alchemy of this intermingling process, however, limited under the colonial constraints, there appeared simultaneously two streams of the national consciousness- one, pan- Indian and the other, regional."* It shows two identities emerging simultaneously. This suggests that regional and pan-India consciousness were not mutually exclusive concepts. However, we cannot assume from it whether these two concepts supported or contradicted each other. Hence, assumption 2 is not correct.

51 (a)

Let the sum be Rs. P and the rate of interest be R% per annum.
According to the question,
Compound interest for the first two years = $P[(1 + R/100)^2 – 1] = 1764$……(i)
Compound interest for the first four years = $P[(1 + R/100)^4 – 1] = 3898.44$……(ii)
On dividing equation (i) by (ii), we get:
$P[(1 + R/100)^2 – 1] / P[(1 + R/100)^4 – 1] = 1764/3898.44$
Or $[(1 + R/100)^2 – 1] / [(1 + R/100)^4 – 1] = 100/221$
Let $(1 + R/100)^2 = x$
Then, $(x – 1)/(x^2 – 1) = 100/221$
Or $1/(x + 1) = 100/221$
Or $100x + 100 = 221$
Or $100x = 121$
Or $x = 121/100$
Or $(1 + R/100)^2 = 121/100$ [Since, $x = (1 + R/100)^2$]
Or $(1 + R/100) = 11/10$
Or $R/100 = 1/10$
Or $R = 10\%$
Now, $P[(1 + R/100)^2 – 1] = 1764$
Or $P[(1 + 10/100)^2 – 1] = 1764$
Or $P[(11/10)^2 – 1] = 1764$
Or $P(21/100) = 1764$
Or $P = 8400$
Thus, the sum was Rs. 8400.
Hence, option (a) is correct.

52 (b)

Number of boys playing Kabaddi and Football = $1200×(10/100)×(2/5) + 1200×(24/100)×(1/2)$
$= 48 + 144 = 192$
Average number of girls playing Chess, Table Tennis and Football = $\{1200×(30/100)×(5/12) + 1200×(18/100)×(11/36) + 1200×(24/100)×(1/2)\} / 3$
$= (150 + 66 + 144)/3$
$= 120$
Required ratio = $192 : 120 = 8 : 5$
Hence, option (b) is correct.

53 (c)

The number of girls playing Kabaddi, Badminton and Football = $1200×(10/100)×(3/5) + 1200×(12/100)×(7/12) + 1200×(24/100)×(1/2)$
$= 72 + 84 + 144 = 300$
The number of boys playing Chess and Table Tennis = $1200×(30/100)×(7/12) + 1200×(18/100)×(25/36)$
$= 210 + 150 = 360$
Required % = $(300/360)×100 = 83.33\%$
Hence, option (c) is correct.

54 (a)

Since, all cricketers started playing at the age of 14 on their respective birthday, we can find out their ages in the year 2000.

Starting year (of playing cricket)	Age in year 2000
1980	14 + 20 = 34 years
1984	14 + 16 = 30 years
1989	14 + 11 = 25 years
1992	14 + 8 = 22 years
1995	14 + 5 = 19 years

Age of Ravindra is 3 years less than the least even-numbered age in the group. From the above table we can see that the least age which is a multiple of 2 (i.e. even) is 22 years.
So, Ravindra`s age = 22 – 3 = 19 years
Hence, age of Ravindra, who started playing in 1995, is 19 years.
Again, the difference between the ages of Robin and Rohit is the square root of the age of one of the five players. Here, perfect square number is 25. So, square root of 25 = 5. From the above table it is clear that the difference between 25 years and 30 years is 5 years. Hence, starting year of Rohit and Robin is either 1984 or 1989.
Now, it is also given that Ramesh is not the oldest player, which means that starting year of Ramesh is 1992.
We can tabulate this information as follows:

Starting year	Player
1980	Rahul
1984	Rohit/Robin
1989	Rohit/Robin
1992	Ramesh
1995	Ravindra

From the above table, we can see that Rahul is the oldest player.

55 (d)

It is clear that age of Robin is either 25 years or 30 years.

56 (d)

From Statement 1:
Q>R>T
From Statement 2:
S/P/U>R/Q
From Statements 1 and 2:
S/P/U>Q>R>T
Thus, we can't find who gets the 3rd highest salary.
The Question cannot be answered even by using both the Statements together.
Hence, option (d) is correct.

57 (b)

Efficiency of (A + B) = 1800/36 = 50
Efficiency of (A + B + D) = 1800/24 = 75
Efficiency of D = 75 – 50 = 25
Efficiency of C = 25×1.2 = 30
Efficiency of A = 30×1/2 = 15
Efficiency of B = 50 – 15 = 35
Work completed in 4 days = 15 + 35 + 30 + 25 = 105 units
Work completed in 68 days = 105×17 = 1785 units
Remaining work = 1800 – 1785 = 15 units
This remaining work (i.e. 15 units) will be completed by A on the 69th day.
Hence, option (b) is correct.

58 (a)

Option (a) is correct: The passage establishes the prevalence of the welfare state concept. However, it acknowledges the emergence of critiques like:

Libertarian view: It violates individual rights through taxation.

General concerns: Its effectiveness and strength are questioned.

These challenges suggest that the welfare state is no longer unquestioningly embraced and subject to scrutiny. Hence, option (a) is correct.

Option (b) is not correct: Foreign funding has not been discussed in the passage. Hence, option (b) is not correct.

Option (c) is not correct: The passage does not mention the context of India and whether the application of the libertarian view is possible in India or not. So, this option is beyond the scope of the passage.

Option (d) is incorrect because option (b) is incorrect.

59 (c)

According to the passage, 98% of the Indian retail market is unorganized. And the second paragraph says that, if FDI in retail is implemented, this unorganized sector may face several challenges. **Option (a) is not the correct answer.**

According to the author, most of small retailers do not pay taxes. In contrast, the aim of introducing FDI is to make the retail sector more defined and organized. Thus, automatically, FDI has the potential to increase tax collection from organized sector. **Option (b) is not the correct answer.**

According to the author, the FDI poses risks to the organized sector. Thus, inference that can be drawn is that, India's should focus on protecting these local kirana stores. But, the focus should be ONLY on these stores is not a correct inference. **Option (c) is the correct answer.**

In contrast to option (c) which is extreme, option (d) is a more logical inference. Introducing FDI cautiously will also help local kirana stores to adapt to new conditions.

60 (a)

Option (a) is correct: The passage establishes a clear correlation between rising temperatures and the nocturnal activity of ibexes in the Alps. The passage says, *"Warmer temperatures caused by climate change are changing the lifestyles of mountain goats".* The passage further mentions, *"This lifestyle shift is making them vulnerable to predators".* Therefore, the central theme of the passage revolves around the impact of climate change on the wildlife of the European Alps, particularly the Alpine ibexes (Capra ibex). Hence, option (a) is correct.

Option (b) is not correct: While the passage states that mother females were less active at night when accompanied by a kid, it doesn't necessarily imply an abandonment of the young kids. Hence, option (b) is not correct.

Option (c) is not correct: The statement seems to be correct in general. However, while the passage focuses specifically on the European Alps, the given statement is rather generic. The aspect of climate is also missing in the given option. Therefore, the core discussion of the passage is not reflected in the given option. Hence, option (c) is not the best answer.

Option (d) is not correct: While the passage highlights the challenges faced by Alpine ibexes due to their nocturnal shift, it does not go far enough to support that the species will undergo extinction. Hence, option (d) is not correct.

61 (a)

All Actors are Dancers (stated in C) and no Singer is Dancer (stated in E) mean that Singers are not Dancers (stated in A).
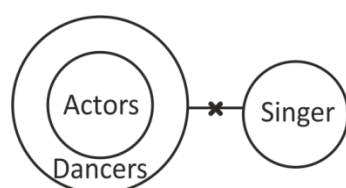
Hence, option (a) is correct.

62 (c)

Let the total number of guests he invited be x.
Number of bowls of biryani = x/5
Number of bowls of manchurian = x/4
Number of bowls of rosogolla = x/10
∵ Total number of bowls of dishes = 55
∴ (x/5) + (x/4) + (x/10) = 55
or (11x/20) = 55
or 11x = 55 × 20
or x = (55 × 20)/11
or x = 100
Since, only 45% of the invited people attended the party
∴ 45% of 100 = 45
Hence, only 45 persons attended the party.
Hence, option (c) is correct.

63 (b)

Let A be the event of passing interview in company P.
Let B be the event of passing interview in company Q.
Given, P(A) = 8/11,
P(B) = 1 – 3/7 = 4/7,
And, P(A∪B) = 13/21
Now, P(A∪B) = P(A) + P(B) – P(A ∩ B)
Or 13/21 = 8/11 + 4/7 – P(A ∩ B)
Or P(A ∩ B) = 100/77 – 13/21
Or P(A ∩ B) = 157/231
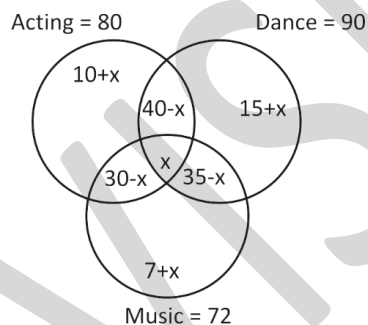The probability that he will pass in both interviews is 157/231.
The probability that he will not pass in both interviews is (1 – 157/231) i.e. 74/231.
Hence, option (b) is correct.

64 (d)

Let the number of students who like all the three - acting, dance and music be 'x'.
Venn diagram:

Number of students who like acting and dance but not music = 40 – x
Number of students who like both acting and music but not dance = 30 – x
Number of students who like both dance and music but not acting = 35 – x
Number of students who like at least one = 137 + x
The minimum possible value of x is 0.
So, the minimum possible number of students who like either acting or dance or music = 137
Hence, option (d) is correct.

65 (b)

Given series: 28, 34, 35, 37, 41, ?, ?
The pattern: The difference between the digits of a number is added to the number itself to obtain the next number:
28 + (8 – 2) = 34
34 + (4 – 3) = 35

$35 + (5 - 3) = 37$
$37 + (7 - 3) = 41$
$41 + (4 - 1) = 44$
$44 + (4 - 4) = 44$
Thus, ?, = 44, 44
Hence, option (b) is correct.

66 (a)

Assumption 1 is correct: While the passage doesn't explicitly state the existence of systemic/structural inequalities, the focus on parental factors alongside individual education suggests their potential role in influencing job opportunities. The passage highlights a correlation between parent's education/employment and individual job prospects. The passage says, *"An individual's likelihood of landing a formal job is positively and significantly influenced not only by their level of education but also by their parents' education and employment".* This clearly suggests that external factors beyond individual control are at play. Hence, assumption 1 is correct.

Assumption 2 is not correct: The passage only mentions the average spending per child in different household types. It doesn't provide information about the distribution of resources within each category. Also, stating that all children have equal access would be an extreme proposition. Hence, assumption 2 is not correct.

67 (b)

Inference 1 is not correct: The passage focuses on using historical DNA as a tool for assessment, not as a definitive predictor of extinction. It doesn't provide information about the severity of diversity loss or extinction risks faced by specific species populations. Hence, inference 1 is not correct.

Inference 2 is correct: The passage says, *"Scientists are using historical DNA to help guide critical conservation decisions".* It further gives specific examples of black rhinos, lions, bearded vultures, Iberian lynx, and Iberian imperial eagles to substantiate the argument. This suggests how this approach is being used to guide critical conservation decisions. Hence, inference 2 is correct.

68 (d)

Assumption 1 is not correct: As per the passage, the Canadian government introduced the Critical Minerals Strategy with significant financial incentives for mining companies. The strategy is framed to help the world transition to a post-carbon economy. But to assume that there will be more long-term economic benefits than short-term environmental costs would be beyond the scope of the passage as the passage does not compare these two. Hence, assumption 1 is not correct.

Assumption 2 is not correct: The given option is very generic and does not have its basis in the arguments made in the passage. The passage does not mention about measures for balancing economic development with environmental protection. It merely presents a situation in Canada based on a policy decision of the government. Hence, assumption 2 is not correct.

69 (c)

Option (a) is not correct: The passage revolves around the central theme of the lack of diversity in our food system which is threatening its sustenance. However, there is no indication towards introducing genetic engineering to fix this issue. **Hence, option (a) is not correct.**

Option (b) is not correct: The passage mentions that the Green Revolution focused on a small number of crops which was the need of the hour. The author states the concerns with the Green Revolution, but does not talk about any significant dip in productivity. On the contrary, the first line talks about an increase in productivity. **Hence, option (b) is not correct.**

Option (c) is correct: The passage establishes a strong link between reduced crop diversity, vulnerability, and the potential instability in our food system. Highlighting the shift from 6,000 domesticated plants to just 9 providing most calories. This emphasizes the scale and rapidity of this change. Words like *"fragile," "safety net," "dependent," and "vulnerable"* directly link the lack of diversity to the associated ecological risks. These arguments are aptly captured in **option (c).**

Option (d) is not correct: While the passage highlights the dangers of a lack of diversity in the food system, it doesn't condemn all efforts to increase food production. Though the author critiques the potential downsides of the Green Revolution, it doesn't make a sweeping generalisation to suggest that all attempts to boost food production are inherently harmful. **Hence, option (d) is not correct.**

70 (c)

Option (a) is not correct: While the passage highlights EU's commitment to scaling up renewable energy and reducing dependence on Russian gas, it doesn't suggest a complete phase-out within such a short timeframe. **Hence, option (a) is not correct.**

Option (b) is not correct: The given option seems to be correct except for the fact that the context of the passage is limited to the EU. There is no mention about India and other similarly placed countries. **Hence, option (b) is beyond the scope of the passage.**

Option (c) is correct: The statement stands correct in the context of the passage as it covers a broader theme which includes the steps taken by EU as reflected in the lines, "*Last week, the **European Union announced a new energy plan that will scale up renewable energy in Europe by mobilising additional investments**, removing roadblocks to renewables roll-out …"* The challenges associated are mentioned in the line, "… **Europe relies upon for 40 per cent of its gas needs**, largely for heating and certain industrial processes. Even though the EU had planned to reduce natural gas consumption by more than 25 per cent by 2030 …".* **Option (c) suitably captures these arguments.**

Option (d) is not correct: While the passage states that Europe relies on Russia for 40% of its gas needs, this is an average figure. It does not suggest that each European country is equally dependent on Russia for its gas requirements. So, this option is beyond the scope of the passage. **Hence, option (d) is not correct.**

71 (a)

The pattern being followed here is illustrated below:
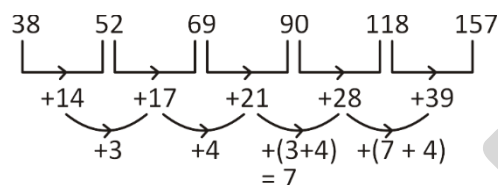
Thus, the wrong term in the series is 88, it should be replaced by 90.
Hence, option (a) is correct.

72 (c)

Two hours = 7200 seconds (9 a.m. to 11 a.m.)
Bottleneck is at machine 'w'. It works slowest among all, i.e. takes 12 seconds per unit. Hence, number of units processed between 9 a.m. and 11 a.m.(i.e. in 7200 seconds) = 7200/12 = 600 packets
Hence, 600 packets will be rolled out till 11 a.m.
Note: Though the 599th and 600th packets will still be under process by machines p, s and t even after 11 a.m., but we can ignore this minor detail and choose the best possible option.
Hence, option (c) is the correct the answer.

73 (b)

Probability of W = P(W) = 5/(5 + 7) = 5/12
Probability of X = P(X) = 4/(9 + 4) = 4/13
Probability of Y = P(Y) = 2/(2 + 7) = 2/9
So, probability of Z = 1 – (5/12 + 4/13 + 2/9) = 1 – 443/468 = 25/468
So, the odds against Z are (468 – 25)/25 i.e. 443 : 25.
Hence, option (b) is correct.

74 (b)

Let Ravi's age five years ago be x.

	Mukta	Ravi
Age 5-years ago:	2x/3	x
Present age	(2x/3) + 5	x + 5
Age after 5 years:	(2x/3) + 10	x + 10

As per the given condition,

$(14/11) \{(2x/3) + 10)\} = (x + 10)$
or $(14/11) \{(2x + 30)/ 3\} = (x + 10)$
or $(28x + 420)/33 = x + 10$
or $28x + 420 = 33x + 330$
or $5x = 90$
or $x = 18$
Mukta's present age $= (2x/3) + 5 = (2 \times 18/3) + 5 = 17$
Ravi's present age $= x + 5 = 18 + 5 = 23$
Hence, option (b) is the correct answer.

75 (c)

Inference 1 is correct: The passage says, *"... the lack of a functional Appellate Body is concerning as global trade ..."* This suggests that the unresolved disputes and lack of a functioning appeal mechanism could further hinder trade flows and exacerbate the existing tensions. Hence, inference 1 is correct.

Inference 2 is not correct: While the passage talks about developed countries introducing environmental trade measures and the potential negative impact on India's trade, it doesn't provide evidence of any intentional targeting or malicious intent towards India particularly. Hence, inference 2 is not correct.

Inference 3 is correct: According to the passage, the US has explicitly stated its opposition to restart appointments and has actively taken a stance against the proposal. The passage says, *"US repeated that it does not support the proposed decision to commence the appointment of Appellate Body members as its longstanding concerns with WTO dispute settlement remain unaddressed"*. This clearly suggests that they won't budge until their issues are dealt with. Hence, inference 3 is correct.

76 (c)

Assumption 1 is correct: The passage describes the multiple facets of the practices of renunciants:

Non-violent way of life: This suggests internal transformation by cultivating compassion and avoiding harm to others.

Renunciation from a worldly ego: This implies internal transformation by detaching from desires and attachments.

Dissociation of self and non-self: This points to internal transformation by understanding the distinction between the true self and the temporary physical body.

Gradual purification of the self: This describes internal transformation by cleansing the mind and soul.

Unobstructed knowledge: This reflects the goal of internal transformation, achieving enlightenment or perfect understanding.

These different aspects combine to suggest a comprehensive approach to personal transformation, addressing both the inner world and outward actions. Hence, assumption 1 is correct.

Assumption 2 is correct: The passage explicitly states that Jaina's metaphysics is *"dualist,"* which implies a belief in two fundamental and distinct realities. It further mentions that Jainism focuses on the *"nature of the self"* and the *"nature of karmic matter,"* suggesting these are separate categories. The concept of *"principles of association"* implies that these two distinct entities, the self and karmic matter, can interact and influence each other in some way – "*Jaina metaphysics is an atomist and dualist conception of the world, it focuses on the nature of the self, on that of karmic matter, **as well as on their principles of association**.*" Hence, assumption 2 is correct.

77 (a)

Assumption 1 is correct: The passage states that music's artistry involves the *"expression of one's feelings and emotions through sound,"* suggesting an emotional connection between creators and listeners. It emphasizes the role of *"melody and harmony"* in this expression, implying that these musical elements contribute to the emotional impact and shared experience. The passage explicitly states that the *"essence of music"* is to create a *"feeling of oneness",* unifying the musician, listeners, and the music itself. This suggests the author sees music as a powerful tool for fostering connection and understanding cutting across societal differences. Hence, assumption 1 is correct.

Assumption 2 is not correct: The passage states, *"The ancient Indian music was actuated by its desire to explore its mystery and tended to proceed from its surface to its centre"*. This only suggests that music started simply by its desire to explore itself by developing a process. The spiritual dimensions are not dealt with in the passage. Hence, assumption 2 is not correct.

78 (a)

The profit is the revenue minus the cost: 65n - (20,000 + 10n) = 55n - 20,000.
Hence, option (a) is the correct answer.

79 (c)

Chief Minister of WB is sitting opposite to Chief Minister of MH and to the immediate right of Chief Minister of UK. Chief Minister of TN is sitting to the immediate right of Chief Minister of AP, so there will be 3 possible cases:
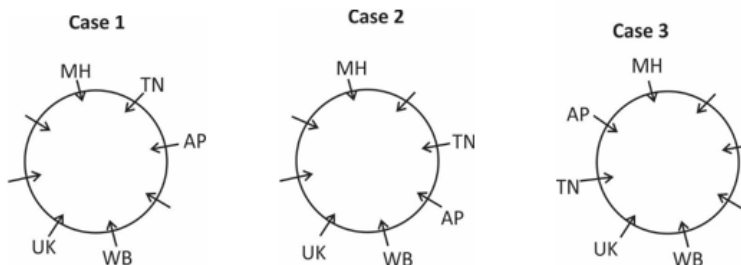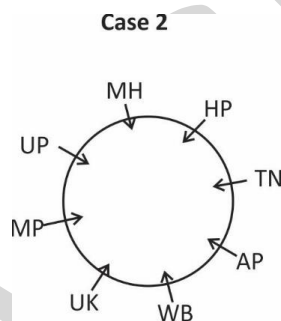

Now, since the Chief Minister of MP is sitting opposite to the Chief Minister of TN, case 1 is eliminated. Now, case 2 and case 3 will be as follows:
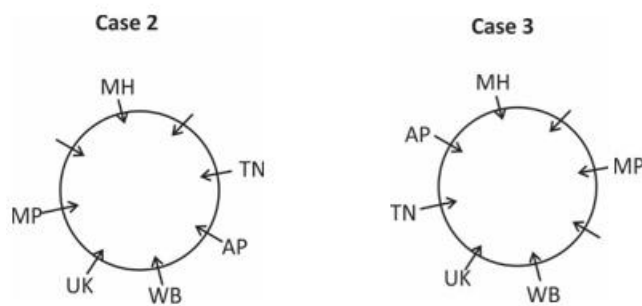
Also, it's given that Chief Minister of MP is not immediately next to Chief Minister of HP. So, case 3 may be eliminated too.
Hence, the final arrangement will be as follows:

Chief Minister of TN is sitting third to the left of the Chief Minister of UP, who is sitting immediately to the right of Chief Minister of MH.
Hence, option (c) is the correct answer.

80 (b)

Chief Minister of WB is not a neighbour of Chief Minister of MH.
Hence, option (b) is the correct answer.