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Academy for Civil Services Pvt. Ltd.

PRELIMS 2023

PAPER II

ANSWER KEY

1. Correct Answer: D

Explanation:

The passage does not state anywhere that collection, processing and segregation of municipal waste should be done by government . There is also no explicit mention in the passage regarding the involvement of private sector enterprises in resource recovery and recycling or whether they are best suited for handling the technological inputs . Therefore, both assumptions a and b cannot be considered correct based on the information provided.

2. Correct Answer: C

Explanation:

The passage emphasizes that the segregation of municipal solid waste at the source is rare in India, and it highlights the importance of proper segregation as the first step in the waste-to-energy process. It mentions that the biodegradable component of the waste is significant (a little over 50 percent) and biomethanation offers a major solution for processing this. However, the passage does not make any direct statements about the cost-effectiveness of energy generation from municipal solid waste or the adequacy of the biodegradable component for efficient energy production.

3. Correct Answer: D

Explanation:

The passage does not provide evidence or make any direct statements to support either assumption. The passage discusses the confusion and lack of regulation in the organic farming industry in India, but it does not state that organic farming is inherently unsafe for both farmers and consumers (assumption 1). Similarly, while it mentions that farmers and consumers are confused about organic products, it does not explicitly state that education is needed about eco-friendly food (assumption 2). Therefore, neither assumption a nor b can be considered correct based on the information provided in the passage.

4. Correct Answer: C

Explanation:

The passage highlights the confusion, lack of regulation, and potential risks associated with organic farming in India. However, it does not suggest that organic farming should not be promoted as a substitute for conventional farming (option a) or that there are no safe organic alternatives to chemical fertilizers (option b). Additionally, the passage does not directly discuss the aim of organic farming being solely about generating profits or the absence of a global market for organic products (option d). Instead, it emphasizes the need for guidance and assistance to farmers in order to make their organic farming practices sustainable, indicating a practical and logical approach to improving the organic farming industry in India.

5. Correct Answer: B

Explanation:

Assumption 2: Dependence on a few crops has negative consequences for human health and the ecosystem. The passage mentions that the focus on increasing food production, particularly staples, has led to lower production and consumption of indigenous traditional crops/grains, fruits, and other vegetables. This implies a negative consequence of depending on a few crops for human health and the ecosystem.

Assumption 3: Government policies regarding food planning need to incorporate nutritional security. The passage highlights that the increase in food grain production has not sufficiently addressed the issue of

malnutrition. This suggests that there is a need for government policies to incorporate nutritional security in food planning.

Assumptions 1 and 4 are not valid based on the information provided in the passage. Assumption 1 suggests that monoculture agriculture practices are inevitable even if they do not address malnutrition, but the passage does not make any direct statements to support this assumption. Assumption 4 implies that farmers receive subsidies and remunerative prices for grains, leading to their lack of consideration for crop diversity. However, this is not mentioned or implied in the passage.

6. Correct Answer: C

Explanation:

For statement 1, Let us assume that no complete group of particular color of balls is drawn. So the total number of balls to be drawn = 13 (black) + 19 (blue) + 25 (green) + 27 (yellow) + 37 (red) + 53 (white) = 174. So any one more ball drawn will complete any one particular group of color of balls. So 175 are to be drawn, which makes the given statement 1 correct.

7. Correct Answer: D

Explanation:

To find the code for the word 'PLAYER' based on the given code 'ZERO' as 'CHUR', we need to identify the pattern or transformation applied to each letter.

From 'ZERO' to 'CHUR', it can be observed that each letter is replaced with the letter that appears two positions ahead in the English alphabet. Using this pattern, we can determine the code for 'PLAYER':

P → S (two positions ahead)

L → O (two positions ahead)

A → D (two positions ahead)

Y → B (two positions ahead)

E → H (two positions ahead)

R → U (two positions ahead)

Therefore, 'PLAYER' is written as 'RNCAGT'.

8. Correct Answer: D

Explanation:

Based on these statements, we can deduce the following:

From statement 1, we know that A is older than B. $\Rightarrow A > B$

From statement 2, we know that C and D are of the same age. $\Rightarrow C = D$

From statement 3, we know that E is the youngest.

From statement 4, we know that F is younger than D. $\Rightarrow D > F$

From statement 5, we know that F is older than A. $\Rightarrow F > A$

$C = D > F > A > B > E$

Therefore, by considering all five statements, we can determine the ages of all individuals. Each statement provides unique information that contributes to the overall understanding of the age relationships between the people.

9. Correct Answer: C

Explanation:

From Statement-1, we know that A and B are married, but it doesn't provide information about E's relation to B.

From Statement-2, we know that D is the father of C, but it doesn't provide information about E's relation to B.

From Statement-3, we know that E is D's son, which doesn't provide direct information about the relation of E to B.

From Statement-4, we know that A and C are sisters, which also doesn't provide direct information about the relation of E to B.

Analyzing the statements in combination, we can derive that E is the brother-in-law of B, as A, C and E are siblings.

Therefore, the correct answer is (C). All four statements together are sufficient to answer the question.



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



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 AYAN AIR 87	 JATIN AIR 91	 PRATEEK AIR 93	 VAIBHAV AIR 104	 RAJAT AIR 111	 JARAD AIR 112	 ABHINAV AIR 137	 MADHAV AIR 148	 CHAITANYA AIR 158				
 SMRITI AIR 4	 ANIRUDDH AIR 8	 KANJIKA AIR 9	 SHRUSTI AIR 165	 NATASHA AIR 175	 KUSH AIR 182	 AYASHA AIR 184	 NAVITA AIR 251	 DRISHTI AIR 255	 MAHIPAL AIR 256	 KRITI AIR 274	 AJAY AIR 276	
 MANISH AIR 283	 RISHABH AIR 294	 SAKSHI AIR 299	 BHUMI AIR 304	 ANSHIKA AIR 306	 SHIVANG AIR 307	 HARSH AIR 310	 ABHIRUCHI AIR 317	 YOGESH AIR 323	 ADITYA AIR 326	 AMAN AIR 332	 AYUSHI AIR 334	 PRANJAL AIR 335
 UTKARSH AIR 336	 RASHIDA AIR 354	 VINOTHINI AIR 360	 DIVYA AIR 363	 KSHITIJ AIR 366	 AMITESH AIR 373	 RAJAT AIR 379	 SONIA AIR 376	 DIVYANSHU AIR 383	 POOJA AIR 390	 SHIV AIR 391	 CAPRIL AIR 397	 ISHAN AIR 409
 CH SHRAYAN AIR 426	 SAHIL AIR 438	 MOHAMED AIR 441	 SANGLE AIR 452	 SWATHIKA AIR 456	 SHRIKESH AIR 457	 BODDU AIR 469	 NARVADE AIR 493	 VINEY AIR 496	 RAHUL AIR 497	 AKSHAT AIR 499	 POOJA AIR 511	 TEJASWINI AIR 516
 ANAMIKA AIR 542	 PALLAVI AIR 546	 PATIL AIR 552	 RAKESH AIR 575	 SUDHIR AIR 576	 YERRAMSETTI AIR 583	 SARTHAK AIR 584	 SUDHA AIR 597	 PRADEEP AIR 601	 MANPREET AIR 616	 YASH AIR 647	 RAHUL AIR 663	 VIKAS AIR 713
 VISHNU AIR 672	 ABHISHEK AIR 673	 VISHNOI AIR 722	 RITU AIR 742	 RAMDENI AIR 742	 AMIT AIR 756	 RAKESH AIR 773	 SOURAB AIR 815	 SAHIL AIR 817	 DIMPY AIR 829	 AMAR AIR 830	 SARAH AIR 832	 PRASHANT AIR 838
 POONAM AIR 840	 BENDUKURI AIR 846	 HARSHVARDHAN AIR 853	 GURSIMRAT AIR 860	 ANUP AIR 879	 AADESH AIR 888	 PARUL AIR 893	 SIDHANT AIR 901	 ABHISHEK AIR 906	 MANOJ AIR 929			

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10. Correct Answer: D

Explanation:

The group that is different from the others is:

(d) 83, 89, 91, 97

In this group, 91 is the only number that is not a prime number. All the other numbers in options (a), (b), and (c) are prime numbers.

11. Correct Answer: B

Explanation:

The passage emphasizes the need for a scientific and evidence-based approach to tackle pollution rather than relying on arbitrary measures. It also highlights the limitations and ineffectiveness of certain actions such as banning vehicles based on age or fuel type without proper assessment. Based on this, the most logical and rational implication conveyed by the passage is:

(b) Knee-jerk reactions cannot solve the problem of pollution, but an evidence-based approach will be more effective.

This statement captures the main idea that hasty and arbitrary measures are not effective in addressing pollution, and instead, a well-informed approach based on scientific evidence is needed.

12. Correct Answer: B

Explanation:

The logical inference from the passage is best reflected by the statement:

(b) Good corporate governance improves the credibility of the firms.

The passage states that effective corporate governance enhances access to external financing by firms, which leads to greater investment, higher growth, and employment. This implies that good corporate governance improves the credibility and trustworthiness of firms in the eyes of investors, making them more attractive for investment.

13. Correct Answer: B

Explanation:

The passage highlights the various ways in which elephants contribute to the ecosystem, such as creating clearings in the forest, propagating seeds through their dung, providing nourishment to plants and animals, and digging water holes that benefit other wildlife. These actions indicate that elephants play a crucial role in maintaining the balance and health of the ecosystem. As a keystone species, their presence has far-reaching effects on other species and the overall biodiversity of the habitat. Therefore, option (b) is the best reflection of the most logical and rational inference from the passage.

14. Correct Answer: A

Explanation:

Placing '+' in place of the symbol given in the question.

$7 + 9 + 10 = 26$, then adding these two digits $2+6$, we get 8.

$9 + 11 + 30 = 50$, adding these two digits we get 5.

$11 + 17 + 21 = 49$, adding these two digits we get 13.

$50, 23 + 4 + 15 = 42$, adding these two digits we get 6.

15. Correct Answer: C

Explanation:

$7x$ is divisible by x as it contains x . 96 will be divisible by x , when x is the factors of 96.

The factors of 96 are $2^5 * 3$.

So the possible values of x are 2, 4, 8, 16, 32, 3, 6, 12, 24, 48, 96, 1

16. Correct Answer: B

Explanation:

To find the greatest value of $(p+q)(r+s)$, we need to maximize the sum of $p+q$ and $r+s$. Since p, q, r , and s are distinct single-digit positive numbers, we want to choose the largest digits for p and q , and the largest digits for r and s .

The largest digits are 9, 8, 7 & 6, so we assign 9 to p and 6 to q . Similarly, we assign 8 to r and 7 to s . Now we have $(9+6)(7+8) = 15 * 15 = 225$.

17. Correct Answer: A

Explanation:

9 written for 99 times can be written as $9(111.....1)$.

Now this is to be divided by 13.

11111 is completely divisible by 13. Similarly 96 1's will be completely divisible by 13 and 3 1's will be left. This means we should find the remainder when 999 is divide by 13. Then the remainder obtained is 11.

18. Correct Answer: C

Explanation:

If 11111111 is multiplied by itself then we get 12345678987654321. Sum of the digits of this number = $1+2+3+4+5+6+7+8+9+8+7+6+5+4+3+2+1 = 81$

19. Correct Answer: B

Explanation:

2 digit comes 19 times from 10 to 100 (20 to 29 (11 times) and 12, 32, 42, 52, 62, 72, 82, 92). Similarly 3 to 9 every digit comes 19 times. 1 digit comes 20 times as 100 is also included.

So sum of these digits = $1*20 + 2*19 + 3*19 + 4*19 + 5*19 + 6*19 + 7*19 + 8*19 + 9*19 = 856$

20. Correct Answer: C

Explanation:

To count the number of distinct triangles that can be formed using three points out of six points, we need to consider the different combinations of points.

From the given information, we have:

- 2 points on BC
- 2 points on DA
- 1 point on AB
- 1 point on CD

To form a triangle, we need to choose 3 points from these 6 points. Therefore, the number of distinct triangles can be calculated using the combination formula " nCr " as follows:

$$\text{Number of triangles} = {}^6C_3 = \frac{6!}{3!(6-3)!} = \frac{6 \times 5 \times 4}{3 \times 2 \times 1} = 20$$

Therefore, the correct answer is (c) 20.

21. Correct Answer: C

Explanation:

The crucial message conveyed by the author of the passage is best reflected in option (c) - "Waiting to deal with carbon emissions until technology improves is not a wise strategy."

The passage emphasizes the long-term impact of human emissions on the climate and the uncertainty surrounding future technological developments. It suggests that relying solely on technological change to address climate change is not a wise strategy. Instead, taking action to reduce carbon emissions now is necessary, regardless of the uncertainty surrounding future technological advancements.

22. Correct Answer: C

Explanation:

The passage discusses the connection between environmental problems and health problems, highlighting the need for substantial lifestyle changes to address these issues. However, it also acknowledges the perceived difficulty in adopting these changes and the collective lethargy towards making healthier choices. Therefore, the assumption that health can still be protected even if environmental problems are not fully addressed aligns with the passage's emphasis on the impact of individual choices on health outcomes. Option (c) reflects this assumption.

23. Correct Answer: B

Explanation:

The crux of the passage is focused on the issue of nutrition and its impact on health and economic progress. It emphasizes that many people are not eating the right food, leading to an increase in non-communicable diseases and burden on healthcare systems. The passage also highlights limited access to nutritious food and a lack of affordability as contributing factors. Additionally, it mentions that food systems are not properly responding to nutritional needs.

Out of the given options, (b) "We must place food-based nutrition at the centre of our policy debate" best reflects the main idea of the passage. It emphasizes the need to prioritize food-based nutrition in policy discussions and actions, suggesting that addressing nutritional issues should be a key focus to improve health and economic outcomes. This aligns with the central theme of the passage, making it the most suitable choice.

24. Correct Answer: A

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25. Correct Answer: D

Explanation:

$p + c / p - c$ can be even:

This statement is correct. The sum of a prime number (p) and a composite number (c) will always be even or odd (ex: $3+9$ or $3+4$). Additionally, the difference between a prime number and a composite number can also be even or odd. Therefore, the fraction $(p + c) / (p - c)$ can result in even number.

$2p + c$ can be odd:

This statement is correct. The sum of twice a prime number ($2p$) and a composite number (c) can be either even or odd, depending on the values of p and c .

pc can be odd:

This statement is correct. The product of a prime number (p) and a composite number (c) can be odd (ex: $3 * 9 = 27$).

26. Correct Answer: A

Explanation:

Since when C is multiplied by D , we get D , the possible values of C and D are 6 and 4 respectively or 1 and any number. With a bit of hit and trial we can take ABC as 936 and D as 4. $936 * 4 = 3744$. So the sum $A+B+C= 18$

27. Correct Answer: D

Explanation:

Let us take an example. Let 465465 be the number of $XYZXYZ$. We can check and see that this number is divisible 7, 11 and 13. It is true for any digits taken.

28. Correct Answer: A

Explanation:

Since we have to find the number of cubes that are surrounded by other cubes from each side, we will remove the side layer of cubes from all the 6 sides. Then we will have cubes of 3 layers left. Then the number of cubes will be equal to $3^3 = 27$



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29. Correct Answer: C

Explanation:

There are 4 odd digits in the number 11223344, which are 1, 1, 3, and 3. We need to arrange these 4 digits to place them in the odd positions (1st, 3rd, 5th, and 7th positions). This can be done in $4!/(2! * 2!) = 6$ ways

There are also 4 even digits in the number 11223344, which are 2, 2, 4, and 4. We need to arrange these 4 digits to place them in the even positions (2nd, 4th, 6th, and 8th positions). This can be done in $4!/(2! * 2!) = 6$ ways.

So the total number of ways = $6 * 6 = 36$ ways

30. Correct Answer: A

Explanation:

A alone can complete the work in 8 days, which means A can complete $1/8$ th of the work in one day.

B alone can complete the work in 16 days, which means B can complete $1/16$ th of the work in one day.

C alone can complete the work in 12 days, which means C can complete $1/12$ th of the work in one day.

Now let's examine the work schedule based on the given information:

On Monday, A works alone and completes $1/8$ th of the work.

On Tuesday, B works alone and completes $1/16$ th of the work.

On Wednesday, C works alone and completes $1/12$ th of the work.

So, the total work done in 3 days = $1/8 + 1/16 + 1/12 = 13/48$.

So in 3 such cycles, which is 9 days, $39/48$ work is done. The remaining work is $9/48$, which will be completed by A and B in the next two days. ($1/8 + 1/16 = 9/48$)

In total it is taking 11 days to finish the work. 11 days starting on Monday will be Thursday.

As the work is completed in 11 days, statement 2 is false and only 1 is true.

31. Correct Answer: A

Explanation:

The most rational, practical, and immediate action required to ensure fair and equitable allocation of water to different stakeholders, based on the information provided, is stated in option (a) - "A national, pragmatic, legal, and policy framework for water allocation should be made."

Creating a national framework for water allocation would help establish a unified approach and guidelines for water management across different states. This framework should take into consideration objective criteria such as specificities of the river basin, population size, existing water use and demand, efficiency of use, projected future use, and environmental concerns. By having a well-defined legal and policy framework, the allocation of water can be done in a fair and equitable manner, considering the needs and priorities of different stakeholders.

Options (b) and (c) propose large-scale infrastructure solutions like linking all river systems or creating water channels between regions of surplus and deficit. While such measures may have their own benefits, they are often complex, expensive, and can have environmental and social consequences. Implementing these solutions without a comprehensive framework and understanding of the specificities of each river basin may not lead to a fair and equitable allocation of water.

Option (d) suggests reducing the water demand of sectors such as agriculture and industry to mitigate the water crisis. While this is an important aspect of sustainable water management, it alone may not address the issue of fair and equitable allocation among different stakeholders.

32. Correct Answer: D

Explanation:

The passage highlights the significant challenges faced by India in terms of health and nutrition, particularly regarding the high prevalence of anaemia, tuberculosis, and malnourishment among its population. It emphasizes the negative impact of these health issues on productivity and cognitive abilities, both in the present and for the future potential of the country.

To address these challenges and achieve rapid economic growth, it is implied that attention should be focused on the health and nutrition of the people. This goes beyond the scope of just skilled workers or specific segments of the population. The passage emphasizes the importance of a holistic approach that prioritizes the overall health and well-being of the entire population, as it is vital for the country's future economic development.

Options (a) and (b) touch on important aspects related to education and skill development, but they do not encompass the broader context of health and nutrition that the passage emphasizes.

Option (c) narrows down the focus to only skilled workers, which does not align with the passage's message of addressing the health and nutrition challenges across the population as a whole.

Therefore, option (d) provides the best reflection of what is implied by the passage, emphasizing the need to prioritize health and nutrition for rapid economic growth as envisioned by India.

33. Correct Answer: C

Explanation:

The passage discusses the challenges faced by marginal and small farmers in India, particularly their low adaptive capabilities to climate change due to various constraints. It highlights the need for adaptation to climate change, alongside a fast mitigation response, to address the losses caused by climate change. The passage also mentions the importance of perception and risk assessment in farmers' decision-making regarding adaptation.

Option (a) suggests that adaptation and mitigation are solely the responsibilities of the government, which does not fully capture the message of the passage. While the government has a role to play in policy recommendations and support, the passage emphasizes the need for farmers' involvement and decision-making in adaptation.

Option (b) focuses on changes in government policies regarding land use patterns, which is not the central theme of the passage. The passage primarily discusses the challenges faced by farmers and the importance of adaptation and risk perception.

Option (d) suggests that mitigation is not possible, which contradicts the passage's mention of the need for both adaptation and mitigation responses to climate change.

34. Correct Answer: D

Explanation:

To find the maximum number of attempts Raj has to make to get a red pair of shoes, we can consider the worst-case scenario where he picks all the non-red shoes before getting a red pair.

First, let's determine the number of non-red shoes in the box. Raj has 9 pairs of white shoes (18 individual shoes) and 8 pairs of black shoes (16 individual shoes). So, the total number of non-red shoes is $18 + 16 = 34$.

A pair of shoes consists of a right shoe and a left shoe. As we consider the worst case scenario, if we assume that he picks all the left or right red shoes, then he will make 10 attempts (as there are 10 pairs of red shoes). The 11th attempt that he will make next will give him a complete pair of red shoes.
So the maximum attempts he has to make = $34+11 = 45$

35. Correct Answer: B

Explanation:

To calculate the number of ways a batsman can score exactly 25 runs by scoring single runs, fours, and sixes only, we can analyze the possible combinations.

Let the number of single runs be x , the number of fours be y and the number of sixes be z .

Let's consider the number of sixes the batsman can hit. The maximum number of sixes that can be hit is 4 because hitting five or more sixes would exceed the target of 25 runs. So, we can have zero to four sixes.

Case 1: 4 sixes. $\Rightarrow x + 4y + 6z = x + 4y + 6*4 = 25. \Rightarrow x+4y = 1$

To satisfy this equation y has to take a value of zero, which is only 1 possibility.

Case 2: 3 sixes

$x + 4y + 6z = x + 4y + 6*3 = 25. \Rightarrow x+4y = 7$

To satisfy this equation y has to take a value of zero and one, then we have 2 possibilities.

Case 3: 2 sixes

$x + 4y + 6z = x + 4y + 6*2 = 25. \Rightarrow x+4y = 13$

To satisfy this equation y has to take a value of 0, 1, 2 or 3, then we have 4 possibilities.

Case 4: 1 six

$x + 4y + 6z = x + 4y + 6*1 = 25 \Rightarrow x+4y = 19$

To satisfy this equation y has to take a value of 0, 1, 2, 3 or 4, then we have 5 possibilities.

Case 5: zero sixes

$x + 4y + 6z = x + 4y + 6*0 = 25 \Rightarrow x+4y = 25$

To satisfy this equation y has to take a value of 0, 1, 2, 3, 4, 5 or 6, then we have 7 possibilities.

So the total number of possibilities = $1+2+4+5+7 = 19$

36. Correct Answer: B

Explanation:

Statement 1 is incorrect, as if one letter goes into a wrong envelope, then the other letter should also go into a wrong envelope.

The number of ways in which 2 of the 4 letters can be placed in correct envelope are $4C_2 = \frac{4!}{2!2!} = 6$

So statement 2 is true

37. Correct Answer: A

Explanation:

$(85 * 87 * 89 * 91 * 95 * 96) / 100 = (17 * 87 * 89 * 91 * 19 * 96) / 4 = (17 * 87 * 89 * 91 * 19 * 24)$

By cancellation of 100 with the multiples of 5.

38. Correct Answer: A

Explanation:

To find the unit digit in the expansion of $(57242)^{(9 \times 7 \times 5 \times 3 \times 1)}$, we need to determine the pattern of the unit digits when the base 57242 is raised to different powers.

Let's observe the pattern of the unit digits of the powers of 57242:

$$57242^1 = 2$$

$$57242^2 = 4$$

$$57242^3 = 8$$

$$57242^4 = 6$$

$$57242^5 = 2$$

$$57242^6 = 4$$

$$57242^7 = 8$$

We can see that the unit digit repeats in a cycle of 4: 2, 4, 8, 6.

Now, let's determine the remainder when $(9 \times 7 \times 5 \times 3 \times 1)$ is divided by 4:

$$9 * 7 * 5 * 3 = 945$$

When it is divided by 4 the remainder is 1. So the unit digit will be power of 2 = $2^1 = 2$

39. Correct Answer: D

Explanation:

Since it is given that $ABC + DEF = 1111$

$$C + F = 11, B + E = 10, A + D = 10$$

The possible values of A, B, C, D, E, and F are:

$$A = 4, D = 6$$

$$B = 3, E = 7$$

$$C = 9, F = 2$$

Adding these values, we get:

$$A + B + C + D + E + F = 4 + 6 + 3 + 7 + 9 + 2 = 31$$

40. Correct Answer: C

Explanation:

The ratio of the number to the sum of its digits is least when the value in the numerator is small and the value in the denominator is big.

199 will be such number, whose sum of the digits is 19. The difference of the digits in hundred's place and unit's place = $9 - 1 = 8$

41. Correct Answer: B

Explanation:

The passage highlights that the unemployment rate in India may not accurately represent the performance of the economy due to factors such as increasing school and college enrollment. The author suggests that the reported unemployment rate is influenced by the experience of younger individuals who face higher employment challenges and are more willing to wait for the right job. The passage also mentions that unemployment challenges are greater for people with secondary or higher education, and rising education levels contribute to the inflation of unemployment challenges. Therefore, statement (b) aligns with the author's argument about the relationship between rising education and unemployment among young Indians.

42. Correct Answer: A

Explanation:

The passage emphasizes the importance of incorporating philosophy into science and government to ensure a comprehensive and meaningful approach. It argues that science alone is not sufficient and that there needs to be a force and discipline outside of the sciences to coordinate and provide direction. Similarly, government suffers from a lack of philosophy. Therefore, statement (A) reflects the message

that statesmen should be well versed in both scientific methods and philosophical thinking to have a holistic understanding of their roles and responsibilities.

43. Correct Answer: D

Explanation:

The passage emphasizes that the end of the state is not to dominate or restrain individuals but to free them from fear and enable them to live and act with full security. It aims to allow individuals to exercise their free reason and live without wasting their strength in negative emotions or acting unfairly towards one another. This concept aligns with the idea of liberty, which encompasses personal freedom, autonomy, and the absence of undue constraints or oppression.

44. Correct Answer: D

Explanation:

To find the remainder when 2^{192} is divided by 6, we can observe a pattern in the powers of 2:

$2^1 = 2$ (remainder 2 when divided by 6)

$2^2 = 4$ (remainder 4 when divided by 6)

$2^3 = 8$ (remainder 2 when divided by 6)

$2^4 = 16$ (remainder 4 when divided by 6)

$2^5 = 32$ (remainder 2 when divided by 6)

We can see that the remainder alternates between 2 and 4 as the power increases in cycles of 2. Since 192 is an even number, the remainder when dividing 2^{192} by 6 will be the same as the remainder when dividing 2^2 by 6, which is 4.

45. Correct Answer: D

Explanation:

Substituting the options and checking we can see that option (d) makes a pattern.

ABCDD ABCCDABBCDAABCD

46. Correct Answer: A

Explanation:

$AB * CD = D08$ (since it is given that $E=0, F=8$).

Adding $D08 + GHI = 975$, which means I should be 7, H should be 6. To get 9 the combination of digits possible are (1,8), (2,7), (3,6), (4,5). Only (4,5) is possible because the remaining digits have already been used. If D is 5 then $AB * CD$ will give a last digit of 5, which is incorrect according to the question. So $D=4$ and $G=5$

Then B has to be 2 to get 8 as last digit. Then the remaining digits are 1 and 3. By hit and trial we get $A=1$ and $C=3$.

So $A+B+C = 1+2+3 = 6$

47. Correct Answer: D

Explanation:

The meaning of the false statement is that no one of R and S is selected. T may be selected. One of P and Q is selected.

Statement 1 is false as there is no possibility of selecting atleast 4 for the job.

Statement 2 is also false as it is given that no one of R and S is selected.

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48. Correct Answer: A

Explanation:

If P is true, then both Q and S are true. But it is not given that the reverse is true, so the 2nd conclusion, if Q is true then P is true can be concluded as false.

The second statement given is that if R and S are true, then T is false.

The first conclusion states that if T is true, then at least one of P and R must be false, which means both P and R can also be false.

Let's see if there will be a case when T is true, and P and R also true. So P is true, Q and S will be true. If R and S are true then T is false. So the case when T is true, and P and R also true is not possible. It means that if T is true, then at least one of P and R must be false is a true conclusion

49. Correct Answer: A

Explanation: It is given that a cuboid of dimensions 7 cm x 5 cm x 3 cm is painted red, green and blue colour on each pair of opposite faces of dimensions 7 cm x 5 cm, 5 cm x 3 cm, 7 cm x 3 cm respectively. If we one layer on each side of the cuboid (as these faces are painted), then we will be left with cuboid which is not painted of dimensions 5cm x 3cm x 1cm= 15 cubes of 1cm. So statement 1 is true.

As the common edge of blue and green color is of 3cm, and the top and bottom cubes on this edge are painted on three sides, there will be only one cube on an edge that is painted with two colors blue and green. There will be two faces of 7cm x 3cm and two faces of 5cm x 3cm. So there will be 4 edges common to these colors and there will be one cube on each edge that is painted two sides, so there will be 4 cubes. So statement 2 is false.

50. Correct Answer: C

Explanation:

To determine the positions of the letter(s) that will remain unchanged when the letters of the word "INCOMPREHENSIBILITIES" are arranged alphabetically in reverse order, let's analyze the word.

The word "INCOMPREHENSIBILITIES" contains the following letters:

I, N, C, O, M, P, R, E, H, E, N, S, **I, B, I, L, I, T, I, E, S**

When arranged alphabetically in reverse order, the letters become:

T, S, S, R, P, O, N, N, M, L, L, I, **I, I, I**, H, E, E, E, C, B

The 2 letters highlighted above will remain unchanged.

51. Correct Answer: D

Explanation:

The passage highlights the challenges and negative consequences associated with an abundance of choices. It suggests that while having limited choices may not be desirable, having an overwhelming number of choices can lead to unhappiness and anxiety. This message aligns with the concept of the paradox of choice, where an excess of options can actually hinder decision-making and satisfaction.

52. Correct Answer: A

Explanation:

The passage suggests that the following solutions are implied for the financialization of household savings in India:

1. A flexible environment is needed to develop solutions.
2. Households need customized solutions.

53. Correct Answer: B

Explanation:

In the passage, it is mentioned that pharmaceutical patents grant the patentee the liberty to determine the prices of medicines during the duration of the patent term. This implies that the patentees have control over the pricing of medicines, which can potentially lead to higher prices for patented drugs. Higher prices can create a burden on the public's ability to access these medicines, particularly if they are

essential for their health. Therefore, this assumption is valid as it aligns with the information provided in the passage.

The passage highlights that the patent regime and price protection provide a legally validated mechanism for patentees to gain returns on their innovation and research costs. However, it also implies that higher prices for patented medicines can be a cost for the public. Therefore, governments need to strike a balance between protecting the rights of patentees and ensuring that patients' requirements for affordable access to medicines are met. This assumption is valid as it reflects the need for a balanced approach in policymaking.

Assumptions 2 and 3 are not directly supported by the information provided in the passage, and thus, they are not valid based on the given text. The valid assumptions are (B) 1 and 4. These assumptions highlight the burden on the public's access to medicines due to patent protection and the need for governments to balance the rights of patentees with the requirements of patients.

54. Correct Answer: C

Explanation:

Both assumptions 1 and 2 are valid based on the passage. Here's an explanation for each assumption:

The passage states that India should ensure the growth of the digital economy while keeping personal data of citizens secure and protected. This implies that privacy protection is not just a matter of individual rights but also has economic value. By safeguarding personal data and privacy, it creates an environment that fosters trust and encourages innovation and economic growth. Therefore, assumption 1 is valid.

The passage highlights that no one will innovate in a surveillance-oriented environment or in a place where personal information is compromised. It suggests that privacy and innovation are fundamentally connected, implying that a lack of privacy can hinder innovation. By emphasizing the need for data protection laws that enable user-centric and privacy-protecting innovation, the passage supports the assumption that there is a link between privacy and innovation. Therefore, assumption 2 is valid.

55. Correct Answer: D

Explanation:

The total maximum marks in all papers together is 400. To get 99% marks, the student should get 396 marks, which is 4 marks short of 400. So these 4 marks can be deducted from P, Q, R and S in different ways shown as below:

P Q R S

4 0 0 0 ==> The student can get 4 less marks in any one of the subjects, so there are 4 ways in this case.

3 1 0 0 ==> Here 3 can be arranged in 4 ways and in the remaining places 1 can be arranged in 3 ways.

Total ways = $4 * 3 = 12$

2 2 0 0 ==> Here 2 can be arranged in 4 ways and the other 2 in 3 ways. Total ways = $4 * 3 / 2 = 6$ (divided by 2 as 2 repeats 2 times)

2 1 1 0 ==> Here 2 can be arranged in 4 ways, one of the 1 in 3 ways as there are 3 remaining places, the other 1 in 2 ways and divide by 2 as 1 repeats twice. Total ways = $4 * 3 * 2 / 2 = 12$ ways

1 1 1 1 ==> Deducting 1 mark in each subject is one other way.

So the total number of ways = $4 + 12 + 6 + 12 + 1 = 35$

56. Correct Answer: C

Explanation:

To determine the number of different ways to design the flag with 4 horizontal stripes using the colors red, green, and yellow, such that no two adjacent stripes have the same color, we can consider the possible arrangements of colors.

Let's analyze the possibilities for each stripe:

The first stripe can be any of the three colors.

The second stripe cannot be the same color as the first stripe, so it has two options.

The third stripe cannot be the same color as the second stripe, so it also has two options.

The fourth stripe cannot be the same color as the third stripe, so it has two options.

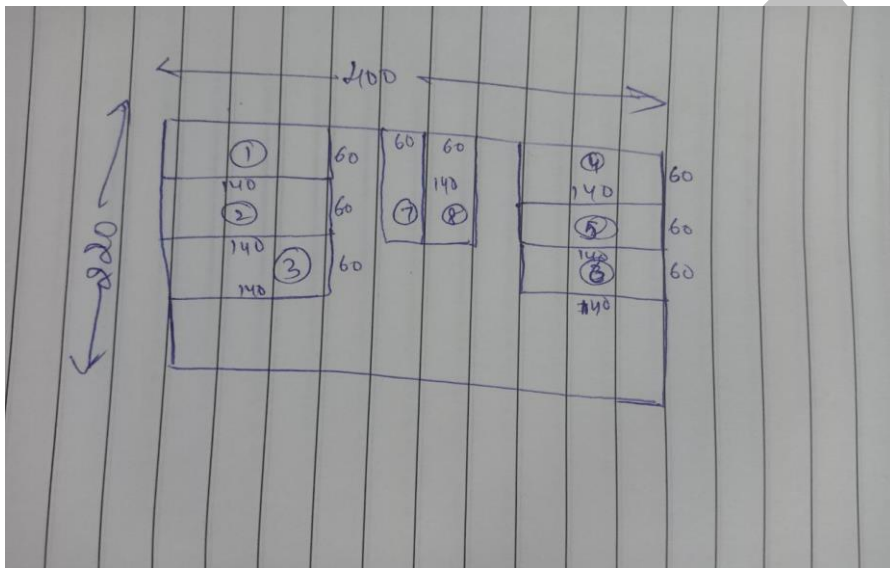
To calculate the total number of arrangements, we multiply the number of options for each stripe:

$$3 \text{ (options for the first stripe)} \times 2 \text{ (options for the second stripe)} \times 2 \text{ (options for the third stripe)} \times 2 \text{ (options for the fourth stripe)} = 24$$

Therefore, there are 24 different ways to design the flag with 4 horizontal stripes using the colors red, green, and yellow, such that no two adjacent stripes have the same color.

57. Correct Answer: C

Explanation:



From the above figure, we can see that 8 tiles can be accommodated at the maximum.

58. Correct Answer: D

Explanation:

Task-1: P and Q cannot be assigned this task. So, it can be assigned to either R, S, or T. There are three options for Task-1.

Task-2: It must be assigned to either R or S. So, there are two options for Task-2.

Let us assume that Task-1 and Task-2 are assigned between R and S in 2 ways. The remaining 3 tasks can be arranged between P, Q and T in $3!$ Ways = 6 ways. So the total number of ways here is $6 \times 2 = 12$ ways

Let us assume that Task-2 is assigned between one of R and S, which is done in 2 ways and Task-1 is assigned to T. The remaining 3 tasks can be arranged between P, Q and R/S in $3!$ Ways = 6 ways. So the total number of ways here is $6 \times 2 = 12$ ways

The total number of ways = $12 + 12 = 24$ ways

59. Correct Answer: C

Explanation:

We can use one coin of 50gms, 2 coins of 10gm each and 4 coins of 2gram each to make 78 grams. $50 + 10 + 10 + 2 + 2 + 2 + 2 = 78$. So the first statement is true, we require atleast 7 coins to buy 78gms of coins.

For the 2nd statement, we can keep one 50gm coin, one 25gm coin and one 5gm coin on one side of the balance, and one 2gm coin on other side of the balance. This makes weighing 78gms possible with 4 coins. So 2nd statement is also true.

60. Correct Answer: B

Explanation:

From the statement, it can be written as follows

$$S = R > T \geq P \geq Q$$

From the above we can see that Q is not equal to S, so conclusion 1 is false. We can also see that S is greater than Q. So conclusion 2 is true.

61. Correct Answer: D

Explanation:

The passage highlights the importance of sourcing food from non-agricultural lands, such as forests, wetlands, and pastures, in addition to agricultural lands. It suggests that a systemic approach to food consumption, which includes agroecosystems, can provide benefits such as food security and resilience to natural disasters and seasonal crop failures.

Option (d) aligns with this message by suggesting the development of agroecosystems alongside conventional agriculture. It acknowledges the need for a diversified approach to food production that integrates non-agricultural lands and practices, such as agroforestry, to enhance food security and sustainability.

The other options (a), (b), and (c) do not capture the comprehensive approach advocated in the passage, focusing on specific aspects (such as replacing trees, criticizing conventional agriculture, or converting wastelands) without considering the broader context of systemic food consumption.

62. Correct Answer: A

Explanation:

The passage highlights the environmental impact of antibiotics manufacturing companies not treating their waste and the pollution caused by these factories, which contributes to the rise of drug-resistant infections. It emphasizes that the occurrence of drug-resistant bacteria around pharmaceutical manufacturing plants is well-known.

Option (A) aligns with this message by suggesting the implementation of proper effluent treatment protocols. This implies that pharmaceutical manufacturing companies should be responsible for treating their waste and ensuring that it does not contribute to pollution or the spread of drug-resistant bacteria. Implementing effective effluent treatment protocols would help mitigate the environmental impact and reduce the risk of drug-resistant infections.

The other options (B), (C), and (D) do not directly address the issue of waste treatment by pharmaceutical companies. Option (B) focuses on promoting environmental awareness among people, which is valuable but does not directly address the specific problem discussed in the passage. Option (C) states that drug-resistant bacteria cannot be eliminated, which does not offer a practical solution to the problem. Option (D) suggests setting up pharmaceutical manufacturing companies in remote rural areas, which may not be a comprehensive solution to address the waste treatment issue.

63. Correct Answer: A

Explanation:

The passage emphasizes the importance of acquiring basic foundation skills during school education before progressing to advanced skills. It states that the benefits of good quality school education are realized when students complete their education with the necessary gateway skills. Without a strong learning foundation at the primary level, there will be no improvement in higher education or skill development.

Option (A) aligns with the central idea of the passage by highlighting the need for India to invest in universal quality education in order to become a global power. It implies that providing a strong educational foundation to all students is essential for their future success and for keeping pace with the global economy.

The other options do not capture the main message of the passage. Option (B) focuses on India's inability to become a global power without promoting the knowledge economy, which is not the main focus of the passage. Option (C) suggests focusing on imparting skills during higher education, which is not the primary argument of the passage. Option (D) introduces the topic of illiterate parents but does not address the main message regarding the importance of acquiring gateway skills in school education.

64. Correct Answer: B

Explanation:

Child-1 will again get the ring when the sum of the gaps will be equal to multiple of 40.

Which means $n(n+1)/2$ should be equal to multiple of 40, where n is the number of gaps

By trail and error from options, if we take $n=15$, then $15*16/2 = 15*8 = 120$

So after 120 changes, the ring will again be in the hands of child 1

65. Correct Answer: B

Explanation:

Z was repeated 2 times, Y was repeated 3 times and so on, so A will be repeated 27 times. So we will add the number $2+3+4+\dots+26+27$ to find where the middle term is.

As this series is in the form of AP, $\text{sum} = 26(2+27)/2 = 13 * 29 = 377$

The middle term will be 189th term. Again to know where 189 will be the sum, we will apply AP again

$189 = n(4+(n-1)1)/2$

$378 = n(3+n) = n^2 + 3n$

$n^2 + 3n - 378 = 0$

We get $n=18$

18th term is repeated, so the final letter is $26-18+1 = 9$ th letter which is I.

66. Correct Answer: D

Explanation:

$P * q$ will be greater than zero when both p & q are positive or negative. So from statement 1 we cannot know if p is greater than q.

Let us assume p is -8 and q is -6, then $p^2 > q^2$ but $p < q$. So we cannot see even from this statement if $p > q$.

Combining both the statements together also we cannot find if $p > q$.

67. Correct Answer: C

Explanation:

The question is if $p+q-r > p-q+r$. This can be written as $q-r > -q+r \Rightarrow 2q > 2r \Rightarrow q > r$.

So we have to find out if $q > r$ from the two given statements

From statement 1 we can understand that $p > q$, but we don't know anything about r, so we cannot tell anything from statement 1.

From statement 2 we can understand that $r > p$ as $p-r$ is negative, but we don't know anything about q, so we cannot tell anything from statement 2.

Combining both the statements, we know that $r > p > q \Rightarrow q < r$. So we need both the statements to answer the question

68. Correct Answer: D

Explanation:

Statement 1 says that 50 persons take milk, but we don't know if these 50 persons took only milk or milk and coffee. So number of persons cannot be found from this.

From statement 2, since we do not know the number of persons who took milk only, we cannot find the number of persons.

Combining both the statements also, we cannot find the answer

69. Correct Answer: D

Explanation:

Statement-1 alone: If the sum of the digits is equal to the product of the digits, it implies that the digits are either 1, 2, or 3 since the sum and product can only be equal for these values. However, there are multiple 3-digit numbers (e.g., 123, 132, 213, 231, 312, 321) that satisfy this condition. Therefore, Statement-1 alone does not provide a unique answer to the question.

Statement-2 alone: If the number is divisible by the sum of its digits, it implies that the sum of the digits is a divisor of the number. This does not provide any specific information about the number itself. For example, if the sum of the digits is 6, there could be multiple 3-digit numbers (e.g., 312, 114, 132) that are divisible by 6. Therefore, Statement-2 alone does not provide a unique answer to the question.

Using both statements together: Using both statements, we have the condition that the sum of the digits is equal to the product of the digits, and the number is divisible by the sum of its digits. However, this still does not provide a unique answer as there are multiple 3-digit numbers (both 312 and 132 satisfy the given conditions) that satisfy these conditions.

Based on the analysis, the correct option is (d) The Question cannot be answered even by using both the Statements together.


70. Correct Answer: B

Explanation:

Since the successive ages differ by 2, if assume age of a to be a, age of b=a+2, age of c=a+4, age of d=a+6, age of e=a+8

Statement 1 says that $e=3a \Rightarrow a+8 = 3a \Rightarrow a=4$. So age of a can be found from this statement alone.

Statement 2 says that $(a+b+c+d+e)/5 = 8 \Rightarrow (5a+20) = 40 \Rightarrow a=4$. So age of a can be found from this statement alone.



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71. Correct Answer: B

Explanation:

To evaluate the correctness of these assumptions:

Global warming is causing spring to come early and for longer durations:

This assumption is not explicitly stated in the passage. The passage mentions that warmer winters with less snow result in a longer lag time between winter and the growing season. However, it does not specifically mention global warming as the cause of this change. Therefore, assumption 1 cannot be concluded from the given information.

Early spring and a longer period of spring is not good for bird populations:

The passage mentions that as the ice melts earlier, the birds don't return, causing a delay or lengthening in springtime ecological events. This implies that early spring may have negative consequences for bird populations. Therefore, assumption 2 is supported by the given information.

72. Correct Answer: A

Explanation:

The passage emphasizes the importance of acquiring basic foundation skills during school education before progressing to advanced skills. It states that the benefits of good quality school education are realized when students complete their education with the necessary gateway skills. Without a strong learning foundation at the primary level, there will be no improvement in higher education or skill development.

Option (A) aligns with the central idea of the passage by highlighting the need for India to invest in universal quality education in order to become a global power. It implies that providing a strong educational foundation to all students is essential for their future success and for keeping pace with the global economy.

The other options do not capture the main message of the passage. Option (B) focuses on India's inability to become a global power without promoting the knowledge economy, which is not the main focus of the passage. Option (C) suggests focusing on imparting skills during higher education, which is not the primary argument of the passage. Option (D) introduces the topic of illiterate parents but does not address the main message regarding the importance of acquiring gateway skills in school education.

73. Correct Answer: A

Explanation:

The passage highlights the significance of climate justice and sustainable lifestyles in the context of environmental discourse. It emphasizes that both principles have implications for the political and economic choices made by nations. However, the passage notes that consensus on these principles has been elusive in climate change summits and compacts.

Option (a) captures the central message of the passage by suggesting that climate justice should be clearly and comprehensively incorporated into the rules and agreements of future climate compacts. It implies that addressing the injustices and inequalities related to climate change should be an integral part of international efforts to combat and adapt to climate change. By incorporating climate justice into the rules and agreements, there is a better chance of providing support, compensation, and adaptation measures for the victims of climate change.

The other options either do not directly address the message of the passage or only touch on certain aspects without fully encompassing the main idea. Option (b) acknowledges the uneven distribution and exploitation of environmental resources but does not specifically address climate justice. Option (c) mentions the issue of dealing with climate change victims or refugees, which is related to climate justice but does not cover the broader implications discussed in the passage. Option (d) focuses on assigning a greater burden to developed countries without considering the multifaceted nature of climate justice and the need for comprehensive measures.

74. Correct Answer: C

Explanation:

We can write $Q=P(1+R/200)^2$ and $Q=P(1+S/100)$

Equating both we get $(1+R/200)^2 = (1+S/100)$

From this we get $S>R$

75. Correct Answer: D

Explanation:

To find the natural numbers that give a remainder of 31 when 1186 is divided by them, we can check the divisors of the difference between 1186 and 31.

$$1186 - 31 = 1155$$

$1155 = 11 * 3 * 5 * 7$. So the total number of factors for $1155 = 2 * 2 * 2 * 2 = 16$ (In general, if the prime factorization of a number is expressed as $p_1^{a_1} * p_2^{a_2} * p_3^{a_3} * \dots$, where p_1, p_2, p_3, \dots are prime factors and a_1, a_2, a_3, \dots are their respective exponents, then the number of factors is given by $(a_1+1) * (a_2+1) * (a_3+1) * \dots$)

Now we have to find the factors that are less than 31, and they are 1, 3, 5, 7, 11, 33, 21. These are 7.

So the number of natural numbers that give a remainder of 31 when 1186 is divided by them is $16-7 = 9$

76. Correct Answer: C

Explanation:

$$pp+qq+rr = tt0 \Rightarrow 11(p+q+r) = 11(tt0)$$

$$\Rightarrow p+q+r = tt0$$

So p can have values from 1-5 and q can have values from 1-6.

Suppose if $p=6$, q can be 7, which will make $p+q=13$, and again r has to be 7 to get 20 (in the form of $tt0$) which is not possible as $q < r$.

So both statement 1 and 2 are true

77. Correct Answer: A

Explanation:

Since the four digit number must be less than 2000, the digit 1 is fixed in thousands place. In the remaining 3 places 2, 3 and 4 are arranged in $3!$ ways = 6

So the numbers will be 1234, 1243, 1324, 1342, 1423, 1432. And some of these numbers will be equal to 7998.

78. Correct Answer: C

Explanation:

In a circle, there are 12 possible reference points since we have 12 things.

Hence, the number of selections of 10 consecutive things out of 12 things in a circle taken in the clockwise direction is 12.

79. Correct Answer: B

Explanation:

The remainder when 10 is divided by 7 is 3. The remainder when 10^2 is divided by 7 is 2. The remainder when 10^3 is divided by 7 is 6. The remainder when 10^4 is divided by 7 is 4. The remainder when 10^5 is divided by 7 is 5. The remainder when 10^6 is divided by 7 is 1. The remainder when 10^7 is divided by 7 is 3. This cycle repeats, so when 10^{10} is divided by 7 the remainder is 4. So the 10^{10} th day will be thursday.

80. Correct Answer: B

Explanation:

To determine when the traffic signals will change to green simultaneously, we need to find the least common multiple (LCM) of the durations for each signal to complete a full cycle (green to red and red to green).

The durations for each signal to complete a full cycle are as follows:

Signal 1: 50 seconds

Signal 2: 78 seconds

Signal 3: 120 seconds

LCM of 50, 78 and 120 is 7800. So 7800 seconds is equal to 2hr 10min. So the correct answer is 4.10pm

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