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Answer Key

**UPSC CSE Prelims 2024:
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(CSAT)**

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**Directions for the following 4 (four) items:**

Read the following *two passages* and answer the items that follow the passages. Your answers to these items should be based on the passages only.

Passage-1

According to the Food and Agriculture Organization, one-third of food produced for human consumption is lost or wasted globally. Food is lost or wasted throughout the supply chain, from initial agricultural production to final household consumption. The increasing wastage also results in land degradation by about 45%, mainly due to deforestation, unsustainable agricultural practices, and excessive groundwater extraction. The energy spent over wasted food results in about 3.5 billion tonnes of carbon dioxide production every year. Decay also leads to harmful emissions of other gases in the atmosphere. Addressing the loss and wastage of food in all forms is critical to complete the cycle of food efficiency and food sustainability.

1. Which of the following statements best reflect the most logical and rational inferences that can be made from the passage?
 1. The current methods of food distribution are solely responsible for the loss and wastage of food.
 2. Land productivity is adversely affected by the prevailing trend food loss and wastage.
 3. Reduction in the loss and wastage of food results in lesser carbon footprint.
 4. Post-harvest technologies to prevent or reduce the loss and wastage of food are not available.



Select the correct answer using the code given below :

- (a) 1, 2 and 3
- (b) 2 and 3 only
- (c) 1, 3 and 4
- (d) 1, 2 and 4

- **Answer:** (b) 2 and 3 only
- **Explanation:** Statement 2 ("Land productivity is adversely affected by the prevailing trend food loss and wastage") is directly supported by the passage which mentions land degradation due to food wastage. Statement 3 ("Reduction in the loss and wastage of food results in lesser carbon footprint") is also supported by the passage that talks about the carbon dioxide production due to wasted food. The other statements are not directly supported by the passage.

2. Based on the above passage, the following assumptions have been made :

1. The food distribution mechanism needs to be reimagined and made effective to reduce the loss and wastage of food.
2. Ensuring the reduction of wastage and loss of food is a social and moral responsibility of all citizens.

Which of the assumptions given above is/are valid?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2



- **Answer:** (a) 1 only
- **Explanation:** The passage suggests that addressing food wastage is essential, implying the need for a better food distribution mechanism (assumption 1). However, it does not directly state that reducing food wastage is a social and moral responsibility of all citizens (assumption 2).

Passage-2

As inflation rises, even governments previously committed to budget discipline are spending freely to help households. Higher interest rates are announced by central banks are supposed to help produce modest fiscal austerity, because to maintain stable debts while paying more to borrow, governments must cut spending or raise taxes. Without the fiscal backup, monetary policy eventually loses traction. Higher interest rates become inflationary, not disinflationary, because they simply lead governments to borrow more to pay rising debt-service costs. The risk of monetary unmooring is greater when public debt rises, because interest rates become more important to budget deficits.

3. Which of the following statements best reflects/reflect the most logical and rational inferences/inferences that can be made from the passage?
1. Central banks cannot bring down inflation without budgetary backing.
 2. The effects of monetary policy depend on the fiscal policies pursued by the government. Select the correct answer using the code given below :
 - (a) 1 only
 - (b) 2 only



(c) Both 1 and 2

(d) Neither 1 nor 2

- **Answer:** (c) Both 1 and 2
- **Explanation:** The passage discusses the relationship between monetary policy and fiscal policy, suggesting that central banks need budgetary backing (inference 1) and that monetary policy's effectiveness depends on fiscal policies (inference 2).

4. Based on the above passage, the following assumptions have been made :

1. Fiscal policies of governments are solely responsible for higher prices.
2. Higher prices do not affect the long-term government bonds. Which of the assumptions given above is/are valid?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

- **Answer:** (d) Neither 1 nor 2
- **Explanation:** The passage does not support the assumption that fiscal policies are solely responsible for higher prices or that higher prices do not affect long-term government bonds.



5. What is the least possible number of cuts required to cut a cube into 64 identical pieces?

- (a) 8
- (b) 9
- (c) 12
- (d) 16

- **Answer:** (b) 9
- **Explanation:** To divide a cube into 64 identical pieces, you need 9 cuts: 3 cuts along each of the three dimensions (length, width, and height). This creates $4 \times 4 \times 4 = 64$ cubes.

6. In the expression $5 * 4 * 3 * 2 * 1$, * is chosen from +, -, \times each at most two times. What is the smallest non-negative value of the expression?

- (a) 3
- (b) 2
- (c) 1
- (d) 0

- **Answer:** (d) 0
- **Explanation:** $5 - 4 - 3 + 2 \times 1 = 5 - 4 - 3 + 2 = 0$

7. A certain number of men can complete a piece of work in $6k$ days, where k is a natural number. By what percent should be number of men be increased so that the work can be completed in $5k$ days?

- (a) 10%



(b) $(50/3)\%$

(c) 20%

(d) 25%

- **Answer:** (c) 20%
- **Explanation:** Let the number of men in the first and second instances be m and n respectively. So, man-days required = $6k \times m = 5k \times n$. Or $6m = 5n$. Or $n = (6/5)m$. Or $n = 1.2m$. Or $n = m + 20\%$ of m . To complete the work in $5k$ days instead of $6k$ days, the number of men should be increased by 20%.

8. X, Y and Z can complete a piece of work individually in 6 hours, 8 hours respectively. However, only one person at a time can work in each hour and nobody can work for two consecutive hours. All the engaged to finish the work. What is the minimum amount of time that they will take to finish the work.

(a) 6 hours 15 minutes

(b) 6 hours 30 minutes

(c) 6 hours 45 minutes

(d) 7 hours

- **Answer:** (c) 6 hours 45 minutes
- **Explanation:** From the question, All of them are working in alternate manner.

$x = 6$ hrs

$y = 8$ hrs

$z = 8$ hrs



Total Work = LCM (6,8,8) = 24 Units

$$m_x = \frac{24}{6} = 4$$

$$m_y = \frac{24}{8} = 3$$

$$m_z = \frac{24}{8} = 3$$

Minimum amount of time = ?

Since the efficiency of y and z are the same, should be working in alternate manner in order to complete the work faster.

∴ the shift should be:

4 - 3 - 4 - 3 - 4 - 3 - 4
(21 units)

But Total Work = 24, only 3 units remain.

Since x can complete 4 units of work in an hour,
He/She can complete 3 units of work in $(\frac{3}{4})$ th of an hour = 45 min

∴ minimum time = 1 + 1 + 1 + 1 + 1 + 1 + 45 mins
= 6 hours 45 mins



9. How many consecutive zeros are there at the end of the integer obtained in the product $1^2 \times 2^4$

$\times 3^6 \times 4^8 \times \dots \times 25^{50}$?

- (a) 50
- (b) 55
- (c) 100
- (d) 200

● **Answer:** (d) 200

● **Explanation:** The number of zeros at the end of a number is determined by the number of pairs of factors 2 and 5 in its prime factorization. Here, for every multiple of 5, there are more than enough factors of 2. The total number of such pairs will be from multiples of 5 up to 2550.

We get a zero when we get 10, which in turn is obtained when 2 and 5 are multiplied. The number of

zeroes will depend on whichever is less in number from among 2 and 5.

In the given product $12 \times 24 \times 36 \times 48 \times \dots \times 2550$, we can deduce that 2 is definitely more in number

than 5. So, the number of zeroes at the end will be equal to the number of 5's in the given product.

The number of 5's in the given expression are:

$510 \rightarrow 10$

$1020 \rightarrow 20$



1530 → 30

2040 → 40

2550 → 100

So, the number of zeroes at the end of the product = $10 + 20 + 30 + 40 + 100 = 200$

10. On January 1st, 2023, a person saved Rs 1. On January 2nd, 2023, he saved Rs. 2 more than that on the previous day. On January 3rd, 2023, he saved Rs. 2 more than that on the previous day and so on. At the end of which date was his total savings a perfect square as well a perfect cube?

- (a) 7th January, 2023
- (b) 8th January, 2023
- (c) 9th January, 2023
- (d) Not possible

- **Answer:** (b) 8th January, 2023
- **Explanation:** The total savings done by the person by 8th January = $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64$. Now, $4^3 = 8^2 = 64$. So, 64 is a perfect square, as well as a perfect cube. So, it satisfies the given conditions.

Directions for the following 4 (four) items :

Read the following two passages and answer the items that follow the passages. Your answers to these items should be based on the passages only.

Passage-1



Today, if we consider cities such as New York, London and Paris as some of the most iconic cities in the world, it is because plans carrying a heavy systems approach were imposed on their precincts. The backbone of the systems theory is the process of translating social, spatial and cultural desirables into mathematical models using computing, statistics, optimization and an algorithmic way of formulating and solving problems. The early universities of the West which began to train professionals in planning, spawned some of the most ingenious planners, who were experts in these domains. The was because these very subjects were absorbed into the planning curriculum that had its roots in the social sciences, geography and architecture. Planning in India, and its education differ from the West.

11. Which one of the following statements best reflects the most logical and rational inference that can be made from the above passage?

- (a) Curriculum for urban planning courses should have diverse and interdisciplinary approach.
 - (b) In India, city administration is under bureaucracy which lacks formal training in urban planning and management.
 - (c) In India, the management of urban areas is a local affair with a chronic problem of insufficient funds.
 - (d) With high density of population and widespread poverty in our urban areas, planned development in them is very difficult.
- **Answer:** (a) Curriculum for urban planning courses should have a diverse and interdisciplinary approach.



- **Explanation:** The passage discusses how the iconic cities benefited from a systems approach and the diverse educational background of planners in the West, implying that a diverse and interdisciplinary approach to urban planning education is essential.

12. Based on the above passage, the following assumptions have been made :

1. India needs a new generation of urban professionals with knowledge relevant to modern urban practice.
2. Indian universities at present have no capacity or potential to impart training in systems approach.

Which of the assumptions given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (a) 1 only
- **Explanation:** The passage suggests that India needs urban professionals with modern and relevant knowledge, but it does not explicitly state that Indian universities lack the capacity to impart such training.

Passage-2

Not every voice on the internet commands the same kind of audience. When anonymous private entities with high capital can pay for more space for their opinions, they are effectively buying a louder voice. If political discourse in the digital sphere is a matter of outshining one's opponent till the election is won, then the quality of politics suffers. The focus of social media is restricted



to the promotion of content that generates more user engagement, regardless of how inflammatory the content may be.

13. Which one of the following statements best reflects the central idea of the above passage ?

- (a) Constructed as a marketplace of views, social media ensures instant access to information.
- (b) Social media are not ideal or moral institutions but the products built by companies to make profits.
- (c) Social media have been created to strengthen democracies.
- (d) In today's world, social media are inevitable for well-informed social life.

- **Answer:** (b) Social media are not ideal or moral institutions but the products built by companies to make profits.
- **Explanation:** The passage emphasizes the role of social media as profit-driven entities that can influence political discourse, suggesting that they are not designed to uphold moral or idealistic values.

14. Based on the above passage, the following assumptions have been made :

1. Internet is not inclusive enough.
2. Internet can adversely affect the quality of policies in a country. Which of the assumptions given above is/are valid?

- (a) 1 only



- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

● **Answer:** (c) Both 1 and 2

● **Explanation:** This is a bit tricky question. Even though not explicitly specified, the assumption from the first sentence is that the internet is not inclusive enough. The passage suggests that the focus on user engagement and the potential for inflammatory content can negatively impact the quality of politics, implying that internet can adversely affect the quality of policies.

15. $222^{333} + 333^{222}$ is divisible by which of the following numbers ?

- (a) 2 and 3 but not 37
- (b) 3 and 37 but not 2
- (c) 2 and 37 but not 3
- (d) 2, 3 and 37

● **Answer:** (b) 3 and 37 but not 2

● **Explanation:** $222^{333} + 333^{222} = [(222)3]111 + [(333)2]111 = [(23 \times 1113)]111 + [(32 \times 1112)]111 = [(8 \times 1113)111 + [(9 \times 1112)]111 = (1112)111 \times [(8 \times 111)111 + (9)111] = 111222 \times [888111 + 9111] = 111 \times (111)221 \times [888111 + 9111]$. Now, we know that $111 = 37 \times 3$. Also, the expression $111222 \times [888111 + 9111]$ is definitely odd. Therefore, the given expression is divisible by 37 and 3, but not 2..



16. What percent of water must be mixed with honey so as to gain 20% by selling the mixture at the cost price of honey ?

- (a) 20%
- (b) 10%
- (c) 5%
- (d) 4%

● **Answer:** (a) 20%

● **Explanation:** Assume 100 units of honey cost Rs. 100

To gain 20% profit, 120 units of honey should be sold.
But to gain 20% profit, the extra 20% should be water.
So, % of water = 20%.

17. What is the rightmost digit preceding the zeros in the value of 30^{30} ?

- (a) 1
- (b) 3
- (c) 7
- (d) 9

● **Answer:** (d) 9



- **Explanation:** $(30)_{30} = (10 \times 3)_{30} = 3_{30} \times 10_{30}$. Since, 10_{30} will result in a 31-digit number with 30 zeros at the end. So, the rightmost digit preceding the zeros will be the unit digit of 3_{30} . Now, $3_{30} = 3(28 + 2) = 3(4 \times 7 + 2)$. We know that $3^1 = 3$; $3^2 = 9$; $3^3 = 27$, i.e. unit digit 7; $3^4 = 81$, i.e. unit digit 1; $3^5 = 3$; and so on. So, we can say that after every 4th power the unit digit will repeat, i.e. 3 has a cyclicity of 4. So, the unit digit of $3(4 \times 7 + 2)$ [which is of the form $3(4n + 2)$] must be 9. Hence, the rightmost digit preceding the zeros will be 9.

18. 421 and 427, when divided by the same number, leave the same remainder 1. How many numbers can be used as the divisor in order to get the same remainder 1 ?

- (a) 1
- (b) 2
- (c) 3
- (d) 4

- **Answer:** (c) 3
- **Explanation:** Here, the numbers are 421 and 427. When we subtract 421 and 427 by 1, we get 420 and 426. Now by taking the prime factors we get: $420 \rightarrow 2 \times 2 \times 3 \times 5 \times 7 \times 1$. $426 \rightarrow 2 \times 3 \times 71 \times 1$. The common factors among them are 2, 3, and 6 (product of 2 and 3). Hence, we can say that 3 numbers can be used as the divisor.



19. A can X contains 399 litres of petrol and a can Y contains 532 litres of diesel. They are to be bottled in bottles of equal size so that whole of petrol and diesel would be separately bottled. The bottle capacity in terms of litres is an integer. How many different bottle sizes are possible?

- (a) 3
- (b) 4
- (c) 5
- (d) 6

● **Answer:** (b) 4

● **Explanation:** Here prime factorisation of 399 and 532 gives,

$$399 = 1 * 3 * 7 * 19$$

$$532 = 1 * 2 * 2 * 7 * 19;$$

Taking the common factors, we get 1, 7, 19 and $7 * 19 = 133$; Therefore bottles of sizes 1 litre, 7 litres, 19 litres and 133 litres can be used to fill the petrol and diesel. Therefore four different bottle sizes are possible; And hence the answer is option (b)

20. Consider the following statements in respect of the sum $S = x + y + z$, where x, y and z are distinct prime numbers each less than 10 :

1. The unit digit of S can be 0.
2. The unit digit of S can be 9.
3. The unit digit of S can be 5.

Which of the statements given above are correct?



- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

- **Answer:** (c) 1 and 3 only
- **Explanation:** The primes less than 10 are 2, 3, 5 and 7. Just substitute and try these on the equation and check whether they satisfy the statements. 2nd statement does not hold for the possible prime values as given.

Direction for the following 3 (three) items :

*Read the following **two passages** and answer the items that follow the passages. Your answers to these items should be based on the passages only.*

Passage—1

By the time children reach class 8, the bulk of them tend to be in the age range of 13 years to 15 years. But in our country, about a quarter of all children in class 8 struggle with reading simple texts and more than half are still unable to do basic arithmetic operations like division. Every year about 25 million young boys and girls from elementary school move into the life that lies for them beyond compulsory schooling. They cannot enter the workforce at least in the organized sector till they are 18. For many families, these children are the first from their families ever to get this far in school. Parents and children expect that such 'graduates' from school will go on to high school and college. Hardly anyone wants to go back to agriculture. On



the other hand, abilities in terms of academic competencies are far lower than they should be even based on curricular expectations of class 8.

21. Based on the above passage, the following assumptions have been made :

1. For effective school education, parents have greater role than the governments.
2. School curriculum that conforms to today's requirements and is uniform for the entire country may address the issues brought out.

Which of the assumptions given a is/are valid?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (d) Neither 1 nor 2

- **Explanation: The passage does not support the idea that parents have a greater role than governments in effective school education. Additionally, it does not imply that a uniform school curriculum for the entire country would address the educational issues mentioned.**

22. Which one of the following statements best reflects the central idea conveyed by the passage?



- (a) Total eradication of poverty in the country will resolve the issue of under-performance of our school-children.
- (b) Monetary incentives to parents and teachers is a strategy to improve the children's academic performance.
- (c) Public policy should ensure that competencies and achievements of young people are aligned with their expectations.
- (d) India is not going to take advantage of the demographic dividend unless some school pass-outs go back to agriculture.

- **Answer:** (c) Public policy should ensure that competencies and achievements of young people are aligned with their expectations.
- **Explanation:** The passage highlights the gap between the competencies of students and the expectations of families, suggesting the need for public policy to address this issue.

Passage—2

We take it for granted now that science has a social responsibility. The idea would not have occurred to Newton or Galileo. They thought of science as an account of the world as it is, and the only responsibility that they acknowledged was to tell the truth. The idea that science is a social enterprise is modern, and it begins at the industrial revolution. We are surprised that we cannot trace a social sense further back, because we nurse the illusion that the industrial revolution ended a golden age.

23. Which one of the following statements best reflects the thinking of the author about the science?

- (a) Science must value the commitment of the scientists.



(b) Science is a product of civilized society and must be used for the promotion of scientific awareness in people.

(c) Industrial revolution was made possible by the advancements in science.

(d) Science must pursue truth but be responsible for social welfare.

- **Answer:** (d) Science must pursue truth but be responsible for social welfare.
- **Explanation:** The passage discusses the evolution of the social responsibility of science, implying that while science should pursue truth, it also has a responsibility towards social welfare.

24. Consider the sequence
A_BCD_BB CDABC_DABC_D

that follows a certain pattern. Which one of the following completes the sequence?

- (a) B, A, D, C
- (b) B, A, C, D
- (c) A, A, C, D
- (d) A, A, D, C

- **Answer:** (c) A, A, C, D
- **Explanation:** When divided into groups of 5 letters each, each group has one letter twice and this happens in the alphabetical order with



each successive group.

A A BCD / A B BCD / ABC C D / ABC D D

That is first group has two As , second group has two Bs and so on.

Filling the rest will get you to the answer.

25. Two persons P and Q enter into a business. P puts ₹ 14,000 more than Q, but P has invested for 8 months and Q has invested for 10 months. If P's share is ₹ 400 more than Q's share out of the total profit of ₹ 2,000, what is the capital contributed by P?

- (a) ₹ 30,000
- (b) ₹ 26,000
- (c) ₹ 24,000
- (d) ₹ 20,000

- **Answer:** (a) ₹ 30,000
- **Explanation:** Amount invested by Q → Q → for 10 months
Amount invested by P → Q+14,000 → for 8 months
Total profit is Rs. 2000 of which P's share is 400 more than Q ie. P's profit is 1200 and Q's is 800.

Ratio of profits=Ratio of investment ie.

$1200/800 = [(Q+14000)*8]/(Q*10)$; Solving this we'll get Q=16,000; P has put 14,000 more than Q. Therefore P's investment=30,000 which is



option(a).

26. P's salary is 20% lower than Q's salary which is 20% lower than R's salary. By how much percent is R's salary more than P's salary?

- (a) 48.75%
- (b) 56.25%
- (c) 60.50%
- (d) 62.25%

- **Answer:** (b) 56.25 %
- **Explanation:** Let R's salary be 100, then Q's salary which is 20% lower would be 80, and P's salary which is 20% lower than Q would be 64.

R's salary is 36 more than P's salary ie. $36/64 * 100 = 56.25\%$;

Salary of R is 56.25% greater than that of P.

27. A number is mistakenly divided by 4 instead of multiplying by 4. What is the percentage change in the result due to this mistake?

- (a) 25%
- (b) 50%
- (c) 72.75%
- (d) 93.75%

- **Answer:** (d) 93.75%



- **Explanation:** Let the number be 100.
Multiplying the number by 4 we get $4 \times 100 = 400$
But by mistake it was divided by 4. The resultant number is $100/4 = 25$
Change in the result = $400 - 25 = 375$;
Required percentage change = $(375/400) \times 100 = 93.75\%$

28. In an examination, 80% of students passed in English, 70% of students passed in Hindi and 15% failed in both the subjects. What is the percentage of students who failed in only one subject?

- (a) 15%
- (b) 20%
- (c) 25%
- (d) 35%

- **Answer:** (b) 20%

- **Explanation:**
80% of students passed in English \rightarrow 20% of students failed in English.
70% of students passed in Hindi \rightarrow 30% of students failed in Hindi.

% of Students who failed in English alone = % of students failed in English - % of students failed in both = 5%

Similarly, % of students who failed in Hindi alone = 15%

Students that failed in only one subject = % of Students who failed in English alone + % of students who failed in Hindi alone = 5% + 15% = 20%



29. A father said to his son, “n years back I was as old as you are now. My present age is four times your age n years back”. If the sum of the present ages of the father and the son is 130 years, what is the difference of their ages?

- (a) 30 years
- (b) 32 years
- (c) 34 years
- (d) 36 years

● **Answer:** (a) 30 years

● **Explanation:**

Let the age of father be F and the age of son be S. According to the question, $(F - n) = S$ Or $F - S = n$ (i)

And $F = 4(S - n)$

Or $F = 4S - 4n$ Or $(4S - F)/4 = n$ (ii)

From equations (i) and (ii), we get: $F - S = (4S - F)/4$

Or $4F - 4S = 4S - F$

Or $5F = 8S$ Or $F/S = 8/5$

Or we can say that, $F = 8k$ and $S = 5k$

Given that, $F + S = 130$ Or

$8k + 5k = 130$

Or $13k = 130$

Or $k = 10$

Hence, age of father (F) = $8k = 80$ years

And age of son (S) = $5k = 50$ years

Difference in their ages = $80 - 50 = 30$ years



30. Consider the following :

1. 1000 litres = 1 m³
2. 1 metric ton = 1000 kg
3. 1 hectare = 10000 m²

Which of the above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

- **Answer:** (d) 1, 2 and 3 only

Directions for the following 4 (four) Items :

*Read the following **two passages** and answer the items that follow the passages. Your answers to these items should be based on the passages only.*

Passage—1

“The history of science is the real history of mankind- In this striking epigram, a nineteenth-century writer links science with its background. Like most epigrams, its power lies in emphasizing by contrast an aspect of truth which may be easily overlooked. In this case, it is easy to overlook the relations between science and mankind, and to treat the former as some abstract third party, which can sometimes be praised for its beneficial influences, but frequently and conveniently blamed for the horrors of war. Science and mankind cannot be divorced from time to time at men’s



convenience. Yet we have seen that, in spite of countless opportunities of improvement, the opening years of the present period of civilization have been dominated by international conflict. Is this the inevitable result of the progress of science or does the fault lie elsewhere?

31. Which of the following is/are emphatically conveyed by the author of the passage?

1. Without science, mankind could not have continued to exist till today.
2. It is the science that will ultimately determine the destiny of mankind. Select the correct answer using the code given below.

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (d) Neither 1 nor 2
- **Explanation:** The passage does not emphasize that without science, mankind could not have continued to exist till today or that science will ultimately determine the destiny of mankind. It highlights the relationship between science and mankind but does not make these specific claims.

32. Based on the above passage, the following assumptions have been made:



1. The horrors of modern life are the inevitable result of the progress of science.
2. The aspect of truth likely to be overlooked is that science is what man has made it.

Which of the assumptions given above is/are correct?

- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- **Answer:** (b) 2 only
 - **Explanation:** The passage implies that the aspect of truth likely to be overlooked is that science is what man has made it. The first assumption is not directly supported by the passage.

Passage—2

Only with long experience and opening of his wares on many a beach where his language is not spoken, will the merchant come to know the worth of what he carries, and what is parochial and what is universal in his choice. Such delicate goods as justice, love and honour, courtesy, and indeed all the things we care for, are valid everywhere but they are variously moulded and often differently handled, and sometimes nearly unrecognizable if you meet them in a foreign land, and the art of learning fundamental common values is perhaps the greatest gain of travel to those who wish to live at ease among their fellows.



33. When we meet other people while we travel, we learn to differentiate between

- (a) imagination and understanding
- (b) communities and nationalities
- (c) local values and universal values
- (d) friends and foes

- **Answer:** (c) local values and universal values
- **Explanation:** The passage discusses how travel helps us understand the universal aspects of values like justice, love, and honor, as well as their local variations.

34. With reference to the above passage, the following assumptions have been made :

1. Travel leads to an understanding of humans.
2. Travel helps those who wish to learn fundamental common values.
3. A person with long experience in travel can resolve differences amongst people.

Which of the assumptions given above are valid?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only



(d) 1, 2 and 3

- **Answer:** (d) 1, 2, and 3

Explanation: The passage suggests that travel leads to understanding humans, helps in learning fundamental common values, and implies that experienced travelers can resolve differences among people.

Assumption 3 is indirectly supported but not explicitly stated in the passage. If UPSC marks statement 3 wrong, the correct answer will be (a) 1 and 2 only. Until then, we stick with option (d) 1, 2 and 3.

35. Let X be a two-digit number and Y be another two-digit number formed by interchanging the digits of X. If $(X + Y)$ is the greatest two-digit number, then what is the number of possible values of X?

(a) 2

(b) 4

(c) 6

(d) 8

- **Answer:** (d) 8

- **Explanation:** Let $X=ab=10a+b$ and $Y=ba=10b+a$;

$X+Y=$ the greatest two digit number $=99$

$11a+11b=99 \rightarrow a+b=9$;

Therefore possible values of a and b are (1,8), (2,7), (3,6), (4,5)

that is $X=ab$ can be of 8 different possible ones.(ie. 18 and 81, 27 and 72, 36 and 63, 45 and 54). Hence answer is (d).



36. Consider the following :

Weight of 6 boys = Weight of 7 girls = Weight of 3 men = Weight of 4 women

If the average weight of the women is 63 kg, then what is the average weight of the boys?

- (a) 40 kg
- (b) 42 kg
- (c) 45 kg
- (d) 63 kg

- **Answer:** (b) 42 kg
- **Explanation:** Given that,
Weight of 6 boys = weight of 4 women = 4×63 ;
Weight of 1 boy = $(63 \times 4) / 6 = 42$ kg; Hence the answer is (b)

37. How many times the hour minute hand coincide in a clock between 10:00 a.m. and 2.00 p.m. (same day)?

- (a) 3 times
- (b) 4 times
- (c) 5 times
- (d) 6 times

- **Answer:** (a) 3 times
- **Explanation:** Between 10 and 11 both hands coincide once $\rightarrow 1$
Between 11 and 12 both hands coincide at '12' which is the same between 12 and 1; $\rightarrow 1$



Between 1 and 2 they coincide again once \rightarrow 1

That is in total - 3; Answer's option (a).

38. The calendar for the year 2025 is same for

- (a) 2029
- (b) 2030
- (c) 2031
- (d) 2033

- **Answer:** (c) 2031
- **Explanation:** The calendar of a non-leap year repeats after 6 or 11 years. The only possible option here is option (c).

39. Let p, q, r and s be distinct positive integers. Let p, q be odd and r, s be even. Consider the following statements :

1. $(p-r)^2(qs)$ is even.
2. $(q-s)q^2s$ is even.
3. $(q+r)^2(p+s)$ is odd.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3



- **Answer:** (d) 1, 2 and 3
- **Explanation:**
 $(p-r)^2(qs) \rightarrow$ Here 's' is even and multiplication with any even makes the whole even; Same applies for $(q-s)q^2s$, The product is even.

$(q+r)^2(p+s) \rightarrow$ Sum of even and odd is always odd \rightarrow $q+r$ is odd and $p+s$ is odd; Product of odd numbers is always odd. Hence $(q+r)^2(p+s)$ is also odd. Hence all statements are correct.

40. What is the angle between the minute hand and hour hand when the clock shows 4:25 hours?

- (a) 12.5°
- (b) 15°
- (c) 17.5°
- (d) 20°

- **Answer:** (c) 17.5°

- **Explanation:**

Minute hand moves 6° per minute.

Therefore, Angle traced by minutes hand in 25 minutes = $25 \times 6^\circ = 150^\circ$

The hour hand moves half a degree in one minute. So, angle traced by hour hand at 4 hours and 25 minutes, i.e. 265 minutes = $265 \times 0.5^\circ = 132.5^\circ$

Thus, the angle between two hands at 4 : 25 = $150^\circ - 132.5^\circ = 17.5^\circ$

Directions for the following 2 (two) items :



Read the following **two passages** and answer the items that follow the passages. Your answers to these items should be based on the passages only.

Passage-1

Conventional classrooms, by emphasizing fixed duration over learning effectiveness, resign themselves to variable outcomes. The tyranny of the classroom is that every learner is subjected to the same set of lectures in the same way for the same duration. In the end, a few learners shine, some survive, and the rest are left behind. After the fixed duration, the classroom model moves on, with not a thought spared for those left behind. This is how we end up with 10 percent employability in our graduates after a decade and half of formal education. Repeating the same ineffectual script in the realm of skill education will not produce different results.

41. Which of the following statements best reflects/reflect the most logical and rational inference/inferences that can be made from the passage?

1. In conventional classroom learning, the central goal is duration of learning rather than attainment of competency.
2. Conventional classrooms encourage one-size-fits-all approach and stamp out all differentiation.

Select the correct answer using the code given below.

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2



- **Answer:** (c) Both 1 and 2
- **Explanation:** The passage criticizes the conventional classroom model for focusing on fixed durations rather than competency and for its one-size-fits-all approach, implying both statements.

42. Based on the above passage, the following assumptions have been made :

1. As a large number of workers in our country are employed in unorganized sector, India does not need to change its present conventional classroom system of education.
2. Even with its present conventional classroom system of education, India produces sufficient number of skilled workers to fully realize the benefits of demographic dividend.

Which of the assumptions given above is/are valid?

- (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- **Answer: (d) Neither 1 nor 2**
 - **Explanation:** The passage does not support the assumptions that India's present conventional classroom system is sufficient or that it produces enough skilled workers to fully realize demographic dividend benefits.

Passage-2

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When a child reaches adolescence, there is apt to be a conflict between the parents and the child, since the latter considers himself to be by now quite capable of managing his own affairs, while the former are filled with parental solicitude, which is often a disguise for love of power. Parents consider, usually, that the various moral problems which arise in adolescence are peculiarly their province. The options they express, however, are so dogmatic that the young seldom confide in them, and usually go their own way in secret.

43. Based on the above passage, the following assumptions have been made :

1. The adolescent does not feel comfortable with his parents because they tend to be dominating and assertive.
2. The adolescent of modern times does not have much respect for parents.

Which of the assumptions given above is/are valid?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (a) 1 only
- **Explanation:** The passage suggests that adolescents feel uncomfortable with their parents due to their dominating and assertive nature, but it does not imply that adolescents have less respect for their parents.



44. Which one of the following statements best reflects the central idea of the above passage?

- (a) Parents in general may not be of much help when children are on their way to becoming adults.
- (b) When children reach adolescence, involvement of parents in their lives is unnecessary.
- (c) Modern-day nuclear families are not capable of bringing up children properly.
- (d) In modern societies, adolescents tend to be stubborn, disobedient and careless.

- **Answer:** (a) Parents in general may not be of much help when children are on their way to becoming adults.
- **Explanation:** The passage discusses the conflict between adolescents and their parents and how this can lead to a lack of communication, implying that parents may not always be helpful during this transitional period.

45. What is the number of fives used in numbering a 260-page book?

- (a) 55
- (b) 56
- (c) 57
- (d) 60

- **Answer:** (b) 56
- **Explanation:**
From 1 to 100, 5 appears 20 times.



Similarly, from 101 to 200, 5 appears 20 times.
Similarly, from 201 to 300, 5 appears 20 times.

Now, we need to check the numbers after 260. Such numbers having 5 are 265, 275, 285, 295 i.e. 4 numbers.

So, the number of 5's used from 1 to 260 = $(20 + 20 + 20) - 4 = 56$

46. What is the sum of the first 28 terms in the following sequence? 1, 1, 2, 1, 3, 2, 1, 4, 3, 2, 1, 5, 4, 3, 2,.....

- (a) 83
- (b) 84
- (c) 85
- (d) 86

- **Answer:** (b) 84
- **Explanation:** The completed sequence would be
1,
1, 2,
1, 3, 2,
1, 4, 3, 2,
1, 5, 4, 3, 2,
1, 6, 5, 4, 3, 2,
1, 7, 6, 5, 4, 3, 2

and the sum is 84.



47. A person buys three articles P, Q and R for ₹ 3,330. If P costs 25% more than R and P costs 20% more than Q, then what is the cost of P?

- (a) ₹ 1,000
- (b) ₹ 1,200
- (c) ₹ 1,250
- (d) ₹ 1,350

• **Answer:** (d) ₹1350

Explanation: Let $Q = 100$, then $R = 120\%$ of $100 = 120$ & $P = 125\%$ of $120 = 150$

So, $P:Q:R = 15:10:12$

Now, $15 + 10 + 12 = 37$ units = Rs. 3330

Or 1 unit = Rs. 90

So, $P = 15$ units = $15 \times 90 =$ Rs. 1350

48. If the sum of the two-digit numbers AB and CD is the three-digit number 1CE, where the letters A, B, C, D, E denote distinct digits, then what is the value of A?

- (a) 9
- (b) 8
- (c) 7
- (d) Cannot be determined due to insufficient data



- **Answer:** (a) 9

- **Explanation:**

Case 1: There's no carry over from B+D

$$A + C = 1C \text{ Or}$$

$$A + C = 10 + C$$

$$\text{Or } A = 10 \text{ (impossible)}$$

Case 2:

There's carry over 1 from B+D

$$A + C + 1 = 1C \text{ Or}$$

$$A + C + 1 = 10 + C \text{ Or}$$

$$A = 9$$

49. Three numbers x, y, z are selected from the set of the first seven natural numbers such that $x > 2y > 3z$. How many such distinct triplets (x, y, z) are possible?

- (a) One triplet
- (b) Two triplets
- (c) Three triplets
- (d) Four triplets

- **Answer:** (d) Four triplets

- **Explanation:** There are four triplets satisfying the given conditions: $(5,2,1)$, $(6,2,1)$, $(7,2,1)$ and $(7,3,1)$



50. The total cost of 4 oranges, 6 mangoes and 8 apples is equal to twice the total cost of 1 orange, 2 mangoes and 5 apples. Consider the following statements :

1. The total cost of 3 oranges, 5 mangoes and 9 apples is equal to the total cost of 4 oranges, 6 mangoes and 8 apples.
2. The total cost of one orange and one mango is equal to the cost of one apple.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (c) Both 1 and 2
- **Explanation:** Let the costs of oranges, mangoes and apples be Or, M and A.

According to the question,

$$4Q + 6M + 8A = 2(Q + 2M + 5A) \text{ Or}$$

$$4Q + 6M + 8A = 2Q + 4M + 10A \text{ Or}$$

$$2Q + 2M = 2A \text{ Or}$$

$$Q + M = A$$

Statement 1: $3Q + 5M + 9A = 4Q + 6M + 8A$ is correct

Or $A = Q + M$ It is already proved.

Statement 2: $Q + M = A$ It is also correct. Hence, both statements 1 & 2 are true.



Directions for the following 3 (three) items :

*Read the following **three passages** and answer the items that follow the passages. Your answers to these items should be based on the passages only.*

Passage-1

When an international team of pumped a carbon dioxide and water mix into underground basalt rocks, basic chemistry took over. The acidic mixture dissolved rocks' calcium and magnesium and formed limestone Basically carbon dioxide is converted into stone, exclaimed the scientists.

51. Which one of the following statements best reflects the most logical, rational and practical suggestion implied by the passage?

- (a) It is a cheap and practical method to produce limestone at commercial level for building purposes.
- (b) This can be used as one of the methods of carbon sequestration.
- (c) Basalt rock can be made a good source of calcium and magnesium minerals by this method.
- (d) Good rock-dissolving acid can be produced by mixing carbon dioxide and water.

- **Answer:** (b) This can be used as one of the methods of carbon sequestration.
- **Explanation:** The passage describes a method of converting carbon dioxide into stone, which is a form of carbon sequestration.

Passage-2

Geographers analyzed 175 satellite images of ocean colour, which is an indicator of Phytoplankton productivity at the ocean's surface, and found that giant icebergs are responsible for storing up to 20 percent of carbon in the Southern Ocean. The researchers discovered that melting water from



giant icebergs which contains iron and other nutrients, supports hitherto unexpectedly high levels of phytoplankton growth.

52. Based on the above passage, the following assumptions have been made :

1. Giant icebergs have a bearing on primary productivity and food chains of the Southern Ocean.
2. Melting of giant icebergs can produce climate change effects and impact world fisheries.

Which of the assumptions given above is/ are valid?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (a) 1 only
- **Explanation:** The passage suggests that giant icebergs affect primary productivity and food chains in the Southern Ocean. While it hints at climate change effects, it does not directly mention world fisheries.

Passage-3

Evolution has endowed caterpillars that feed on corn with a unique ability, they can induce the plant to turn off its defence against insect predators. This helps caterpillars to eat more and grow faster. The agent that causes this effect is the caterpillar's faeces or frass. The find could throw new light on compounds associated with plant response to pathogens like fungi or bacteria.



53. Which one of the following statements best reflect the most logical and rational and practical message conveyed by the passage?

- (a) Farmers can use caterpillars to feed on weeds in their crop fields/plantations.
- (b) This finding can help in the development of clinically useful antimicrobial compounds.
- (c) This finding can help in the development of organic, ecologically sustainable pesticides.
- (d) Caterpillars can be genetically modified to be predators of the other plant pests.

- **Answer:** (c) This finding can help in the development of organic ecologically sustainable pesticides.

Explanation: The passage describes how caterpillars affect corn plant defenses, which could lead to the development of sustainable pesticides.

54. $32^5 + 2^{27}$ is divisible by

- (a) 3
- (b) 7
- (c) 10
- (d) 11

- **Answer:** (c) 10

- **Explanation:**

$$32^5 + 2^{27} = (2^5)^5 + 2^{27} = 2^{25} + 2^{27} = 2^{25} (1 + 2^2)$$



$$\begin{aligned} &= 2^{25} * 5 \\ &= 2^{24+1} * 5 \\ &= 2^{24} * 2^1 * 5 \\ &= 2^{24} * 10. \end{aligned}$$

Therefore the given expression is completely divisible by 10.

55. Let p and q be positive integers satisfying $p < q$ and $p + q = k$. What is the smallest value of k that does not determine p and q uniquely?

- (a) 3
- (b) 4
- (c) 5
- (d) 6

- **Answer:** (c) 5
- **Explanation:** Substitute each option to the value of k.

Case 1: If $k = 3$

$$p + q = 3$$

$$1 + 2 = 3$$

Here, p and q have unique values. Hence, this is discarded.

Case 2: If $k = 4$

$$p + q = 4$$

$$1 + 3 = 4$$

Here, p and q have unique values. Hence, this is discarded.

Case 3: If $k = 5$

$$p + q = 5$$

$$1 + 4 = 5, 2 + 3 = 5$$

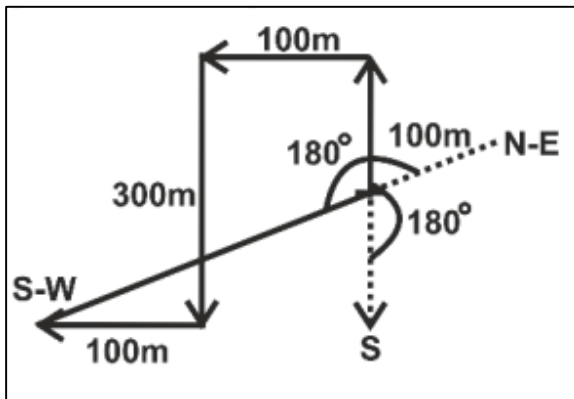
Thus, here p can be 1 or 2 and q can be 4 or 3. So, here p and q have multiple possible values.



56. A person walks 100 m straight from his house, turns left and walks 100 m, again turns left and walks 300 m, then turns right and walks 100 m to reach his office. In which direction does he walk initially from his house if his office is exactly in the North-East direction?

- (a) North-West
- (b) West
- (c) South
- (d) South-West

- **Answer:** (c) South
- **Explanation:** By retracing the steps and considering the final position being North-East, the initial direction must be South.



57. A person walks 100 m Westward, then turns left and walks 100 m. He then takes 225° turn clockwise. In which direction is he walking now?

- (a) South-West



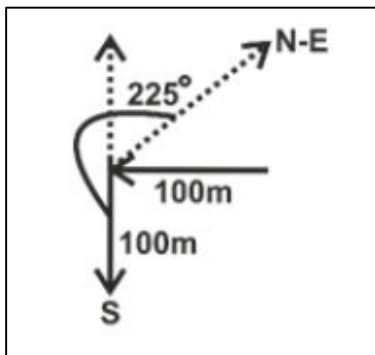
(b) South-East

(c) North-West

(d) North-East

● **Answer:** (d) North-East

● **Explanation:**



58. A Statement is given followed by two Conclusions numbered I and II. Consider the Statement and the Conclusions.

Statement : India is the world's largest producer of milk.

Conclusion-I: India is the world's largest exporter of milk.

Conclusion-II: India does not import milk.

Which one of the following is correct?

(a) Only Conclusion-I follows



- (b) Only Conclusion-II follows
- (c) Both Conclusion-I and Conclusion-II follow
- (d) Neither Conclusion-I nor Conclusion-II follows

- **Answer:** (d) Neither Conclusion-I nor Conclusion-II follows
- **Explanation:** Here information regarding the demand and consumption for milk in India. And also we don't know if there is any other major exporter. Hence Conclusion-1 cant follow.

Conclusion-II cant follow simply because the information regarding whether production is satisfying th domestic demand is absent. If it is not then we may have to import. So Conclusion-I also does not follow.

59. A Question is given followed by two Statements I and II. Consider the Questions and the Statements.

Question :

What are the values of m and n , where m and n are natural numbers? Statement-I :

$$m + n > mn \text{ and}$$

$$m > n.$$

Statement-II :

The product of m and n is 24.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone



- (b) The Question can be answered by using either Statement alone
- (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
- (d) The Question cannot be answered even by using both the Statements together

Answer: (c) The Question can be answered by using both the Statements together but cannot be answered using either Statement alone. –

Explanation: Both statements together can be used to solve for mmm and nnn.

60. A Question is given followed by two Statements I and II. Consider the Questions and the Statements.

Question :

What is the time required to download the software? Statement-I :

The size of the software is 12 megabytes. Statement-II :

The transfer rate is 2.4 kilobytes per second.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- (b) The Question can be answered by using either Statement alone



(c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone

(d) The Question cannot be answered even by using both the Statements together

Answer: (c) The Question can be answered by using both the Statements together but cannot be answered using either Statement alone.

Explanation: Both the size of the software and the transfer rate are needed to calculate the download time.

Directions for the following 3 (three) items :

*Read the following **three passages** and answer the items that follow the passages. Your answers to these items should be based on the passages only.*

Passage-1

In a robust democracy, reality, howsoever inconvenient it may be, finds its expression both in the speech of political leaders and the other social forms of assertion. The existence of the real has to be transparent, both through its circulation in and by the media as well as its argumentative articulation in deliberative democracy. A normatively responsible media through its communication effect has the responsibility to circulate the content of reality without distortion.

61. Which one of the following statements best reflects the crux of the above passage?

(a) Responsible media should not distort the real in an ideal democracy.



- (b) Fake news seems inherent in the life of an ideal democracy.
- (c) There should not be any kind of restrictions on the freedom of expression in an ideal democracy.
- (d) Irresponsible media and political leaders cannot be effectively controlled in an ideal democracy.

- **Answer:** (a) Responsible media should not distort the real in an ideal democracy.
- **Explanation:** The passage emphasizes the importance of responsible media in conveying the truth in a democracy, without distortion.

Passage - 2

Now-a-day there is a growing trend to use interconnected home devices. As consumers increasingly network their homes, the connected home device manufacturers and service providers will seek to overcome "thin profit margins by gathering more of our personal data-with or without our agreement- turning the home into a corporate storefront". Corporate marketers will have powerful incentives to observe consumer behaviour to understand the buying needs and preferences of the device owners.

62. Which one of the following statements best reflects the most logical, rational and practical message implied by the passage?

- (a) Knowledge of consumer behaviour leads to more capital expenditure in manufacturing sector.
- (b) Knowledge of consumer behaviour stimulates the growth of commerce and trade and thus helps in the overall economic development of the country.



(c) Interconnected devices give a lot of comfort to home users and improve the overall quality of life.

(d) Interconnected devices can be at security risk and home users may have privacy risk.

- **Answer:** (d) Interconnected devices can be at security risk and home users may have privacy risk.
- **Explanation:** The passage discusses the risks associated with interconnected home devices, particularly regarding privacy and security.

Passage -3

Green growth involves rethinking growth strategies with regard to the impacts on environmental sustainability and the environmental resources available to poor and vulnerable groups. In rethinking growth, we need to focus on the current reality of a resource-constrained world. Resource intensive and, in particular energy intensive processes will need to make way for more efficient and resource frugal development strategies if we are to avoid an economic dead end or a world in which only a small elite is able to enjoy affluence in the midst of a sea of poverty.

63. Which one of the following statements best reflects the crux of the above passage?

- (a) Environmental sustainability is inimical to our objective of achieving a high rate of GDP growth.
- (b) Poverty eradication is not possible without a rapid economic growth and the consequent environmental degradation.
- (c) Maintaining high environmental standards is now a prerequisite for achieving a steady, sufficient and inclusive growth.



(d) With large populations, rampant poverty and limited resources of today's world, environmental degradation cannot be prevented and inequalities are inevitable.

- **Answer:** (c) Maintaining high environmental standards is now a prerequisite for achieving a steady, sufficient, and inclusive growth.
- **Explanation:** The passage argues that environmental sustainability is essential for long-term economic growth and equity.

64. A question is given followed by two Statements I and II. Consider the Question and the Statements.

Question :

What are the unique values of x and y , where x, y are distinct natural numbers? Statement-I : x/y is odd.

Statement-II : $xy = 12$

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- (b) The Question can be answered by using either Statement alone
- (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
- (d) The Question cannot be answered even by using both the Statements together



Answer: (c) The Question can be answered by using both the Statements together but cannot be answered using either Statement alone.

- **Explanation: Both statements together provide enough information to determine the unique values of xxx and yyy (i.e., 3 and 4).**

65. A Question is given followed by two Statements I and II. Consider the Question and the Statements.

A certain amount was distributed among X, Y and Z.

Question :

Who received the least amount? Statement-I :

X received $\frac{4}{5}$ of what Y and Z together received. Statement-II:

Y received $\frac{2}{7}$ of what X and Z together received.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- (b) The Question can be answered by using either Statement alone
- (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
- (d) The Question cannot be answered even by using both the Statements together



- **Answer:** (c) The Question can be answered by using both the Statements together but cannot be answered using either Statement alone.
- **Explanation:** Both statements are needed to compare the amounts received by X, Y, and Z.

66. A Question is given followed by two Statements I and II. Consider the Question and the Statements.

Question : If the average marks in a class are 60, then what is the number of students in the class?

Statement-I : The highest marks in the class are 70 and the lowest marks are 50.

Statement-II : Exclusion of highest and lowest marks from the class does not change the average.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
 - (b) The Question can be answered by using either Statement alone
 - (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
 - (d) The Question cannot be answered even by using both the Statements together
- **Answer:** (d) The Question cannot be answered even by using both the Statements together



- **Explanation:** Given that the average marks in a class are 60.

Looking at statement-I alone:

The highest marks in the class are 70 and lowest marks are 50. This statement is not sufficient, as the strength of the class can be anything.

Looking at statement-II alone: Exclusion of highest and lowest marks from the class doesn't change the average. This statement is also not sufficient, as we don't get any information regarding the strength of the class.

67. A Question is given followed by two Statements I and II. Consider the Question and the Statements.

There are three distinct prime numbers whose sum is a prime number.

Question : What are those three numbers?

Statement-I : Their sum is less than 23.

Statement-II : One of the numbers is 5.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- (b) The Question can be answered by using either Statement alone
- (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
- (d) The Question cannot be answered even by using both the Statements together



- **Answer:** (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- **Explanation:** Given that the average marks in a class are 60. From the question there are 3 prime numbers whose sum is a prime number. Here the sum will be an odd number as it is a prime and the 3 prime numbers also should be odd:
As, $\text{odd} + \text{odd} + 2 = \text{even}$ (2 is the only even prime number). So 2 is not in the 3 prime numbers.

There it should be $\text{odd} + \text{odd} + \text{odd}$ which gives an odd number.

Let's take the first statement; the sum of 3 prime numbers is less than 23,
i.e., the 3 numbers is definitely less than 23

Taking prime numbers less than 23 \rightarrow 2,3,5,7,11,13,17

Trial 1: $3+5+7 = 15$; not a prime

Trial 2: $3+5+11 = 19$; is a prime also less than 23

Trial 3: $3+5+13 = 21$; not a prime

Trial 4: $3+5+17 = 25$; neither prime nor less than 23

Therefore only possible input is 3, 5 and 11 as continuing trial only proves that if the sum is a prime then it will be greater than 3; This contradicts Statement 1

Statement 2 states that one of the integer is 5 which is not needed as we will know that from the trials



68. A Question is given followed by two Statements I and II. Consider the Question and the Statements.

Question : Is $(x+y)$ an integer?

Statement-I : $(2x+y)$ is an integer.

Statement-II : $(x+2y)$ is an integer.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
 - (b) The Question can be answered by using either Statement alone
 - (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
 - (d) The Question cannot be answered even by using both the Statements together
- **Answer:** (d) The Question cannot be answered even by using both the Statements together
 - **Explanation:** To find if $(x+y)$ is an integer

From statements 1 and 2 it is clear that $(2x + y)$ and $(x + 2y)$ is an integer. Let's give $x = 1/3$ and $y = 1/3$

Then, $2x + y = 2/3 + 1/3 = 3/3 = 1$; Statement 1 is valid for given values of x and y

Now, $x + 2y = 1/3 + 2/3 = 3/3 = 1$; Statement 2 is valid for given values of x and y



Applying it in $(x + y)$

$$x + y = 1/3 + 1/3 = 2/3; \text{ which is not an Integer}$$

Therefore the question can't be answered with both the statements

69. A Question is given followed by two Statement I and II. Consider the Question and the Statements.

A person buys three articles p, q and r for ₹50. The price of the article q is ₹16 which is the least.

Question : What is the price of the article p?

Statement-I : The cost of p is not more than that of r.

Statement-II : The cost of r is not more than that of p

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
 - (b) The Question can be answered by using either Statement alone
 - (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
 - (d) The Question cannot be answered even by using both the Statements together
- **Answer:** (c) The Question cannot be answered even by using both the Statements together



- **Explanation:** Given that, $p+q+r = \text{Rs. } 50$

$$q = 16 \text{ (least)}$$

$$\text{Therefore, } p + r = 16$$

To find price of p

$$\text{Statement 1} = p \leq r$$

$$\text{Statement 2} = r \leq p$$

$$\text{Therefore } p=q$$

Consider the cost of both p and q as 'x', then, $p + q + r = 50$

$$q + 2x = 50$$

$$16 + 2x = 50$$

$$2x = 34$$

$$x = 17$$

i.e., cost of p is 17

We need both the statements to know that $p = r$

70. 70. A Question is given followed by two Statements I and II. Consider the Question and the Statements.

P, Q, R and S appeared in a test.

Question :

Has P scored more marks than Q ?

Statement-I :

The sum of the marks scored by P and Q is equal to the sum of the marks scored by R and S.



Statement-II :

The sum of the marks scored by P and S is more than the sum of the marks scored by Q and R.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
 - (b) The Question can be answered by using either Statement alone
 - (c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone
 - (d) The Question cannot be answered even by using both the Statements together
- **Answer:** (d) The Question cannot be answered even by using both the Statements together
 - **Explanation:** Using statement-I alone: $P + Q = R + S$ (i)
So, from statement -I alone we cannot say that P scored more than Q or not.

Using statement-II alone: $(P + S) > (Q + R)$ (ii)

So, from statement -II alone also, we cannot say that P scored more than Q or not.

Not even after combining both the statements, we can definitely say that P scored more than Q or not. Therefore, this question cannot be answered even by using both of the statements together.



Directions for the following 2 (two) items :

*Read the following **two passages** and answer the items that follow the passages. Your answers to these items should be based on the passage only.*

Passage-1

Unlike religion and science, poetry does not posit or expect any belief in absolute truths. Those forces or individuals who claim to have absolute truths in their grasp tend to turn dictatorial and tyrannical. Truth usually does not admit any contradictions or imperfections. It is Unitarian. It is, therefore, not of much use for poetry. Poetry abides by the plurality of life and existence. Perhaps poetry follows reality which is plural, anachronistic, full of contradictions. Against the tyranny of truth, poetry remains a partisan of democratic reality. Against the arrogance of power, wealth and hierarchy, poetry proposes both humility and defiance.

71. Which one of the following statements best reflects the most logical and rational message conveyed by the above passage?

- (a) It is the poetry, not science or religion, which recognizes and accepts imperfections in humans.
- (b) Truth is revealed through science or religion and poetry is anathema to truth.
- (c) Poetry is romantic, imaginary and is about feeling whereas science and religion are about truth.
- (d) In a world of violence, tyranny and bigotry, poetry is a form of dynamic resistance.

- **Answer:** (d) In a world of violence, tyranny, and bigotry, poetry is a form of dynamic resistance.



- **Explanation:** The passage discusses how poetry resists the arrogance of power, wealth, and hierarchy, suggesting that poetry is a form of resistance against negative societal forces.

Passage-2

The flower was not invented to please us. It flaunted its petals and spread its perfume to attract an insect. The insect carries the pollen from flower to flower so that pollen is not carried away by wind and thus not wasted. What we call a flower's beauty is merely a by-product and a human invention. The perfume is not there to please us, it pleases us because it is there and we have been conditioned to it.

72. Based on the above passage, the following assumptions have been made :

1. The author of the passage believes that flowers are creations of Nature's luxury.
2. The author of the passage does not believe in the usefulness of flowers except as things of beauty.

Which of the assumptions given above is/are valid?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2
- **Answer:** (d) Neither 1 nor 2
 - **Explanation:** The passage does not support the assumption that the author believes flowers are creations of Nature's luxury or that the



author does not believe in the usefulness of flowers except as things of beauty. The passage focuses on the practical role of flowers in nature.

73. Question is given followed by two Statements I and II. Consider the Question and the Statements.

Age of each of P and Q is less than 100 years but more than 10 years. If you interchange the digits of the age of P, the number represents the age of Q. Question : What is the difference of their ages?

Statement-I : The age of P is greater than the age of Q.

Statement-II : The sum of their ages is $11/6$ times their difference.

Which one of the following is correct in respect of the above Question and the Statements?

- (a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone
- (b) The Question can be answered by using either Statement alone
- (c) The Question can be answered by using both Statements together, but cannot be answered using either Statement alone
- (d) The Question cannot be answered even by using both the Statements together

Answer: (a)) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone

- **Explanation:** Given that age of P and Q is less than 100 but more than 10.

This implies both P and Q are two-digit numbers. So, $10 < P, Q < 100$



Also, let $P = xy$, then $Q = yx$

Statement-I alone:

$$P > Q$$

There are various possibilities: $81 > 18$, $72 > 27$... and so on. It alone is not sufficient.

Statement-II alone: $P + Q = (11/6) (P - Q)$

$$\text{Or } 10x + y + 10y + x = (11/6) (10x + y - 10y - x) \text{ Or}$$

$$11(x + y) = (11/6) (9x - 9y) \text{ Or}$$

$$6(x + y) = 9(x - y) \text{ Or}$$

$$2x + 2y = 3x - 3y \text{ Or}$$

$$x = 5y$$

As, x and y must be one-digit numbers, y must be 1 and x therefore must be 5.

$$\text{So, } P = 51 \text{ and } Q = 15$$

$$\text{So, difference in their ages} = P - Q = 51 - 15 = 36 \text{ years}$$

So, statement-II alone is sufficient to answer this question. Hence, the question can be answered by using one of the statements alone, but cannot be answered using the other statement alone.

74. Main Statement is followed by four Statements labelled P, Q, R and S. Choose the ordered pair of the Statements where the first Statement implies the second, and the two Statements are logically consistent with the Main Statement.

Main Statement :



Pradeep becomes either a Director or a Producer. Statement P : Pradeep is a Director.

Statement Q : Pradeep is a Producer.

Statement R : Pradeep is not a Director.

Statement S : Pradeep is not a Producer.

Select the correct answer.

- (a) SP only
- (b) RQ only
- (c) Both SP and RQ
- (d) Neither SP nor RQ

Answer: (c) Both SP and RQ

- **Explanation: If Pradeep is not a Producer (S), he must be a Director (P). If Pradeep is not a Director (R), he must be a Producer (Q). Both pairs are logically consistent with the main statement.**

75. $a + b$ means $a - b$; $a - b$ means $a \times b$; $a \times b$ means $a \div b$; $a \div b$ means $a + b$, then what is the value of $10 + 30 - 100 \times 50 \div 25$? (Operations are to be replaced simultaneously)

- (a) 15
- (b) 0
- (c) -15
- (d) -25



- **Answer:** (d) -25-25-25
- **Explanation:** Substituting the operations: On changing the mathematical signs according to the given instructions, we get:

$$10 - 30 \times 100 \ 50 + 25$$

$$= 10 - 30 \times 2 + 25$$

$$= 10 - 60 + 25$$

$$= 35 - 60$$

$$= - 25.$$

76. If P means 'greater than (>)'; Q means 'less than (<)'; R means 'not greater than ()'; S means 'not less than ()' and T means 'equal to (=)', then consider the following statements :

1. If $2x(S)3y$ and $3x(T)4z$, then $9y(P)8z$.
2. If $x(Q)2y$ and $y(R)z$, then $x(R)z$.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

- **Answer:** (d) Neither 1 nor 2

- **Explanation:**

S1: $2x(S)3y$ and $3x(T)4z$, then $9y(P)8z$

$2x$ not greater than $3y$ and $3x = 4z$, then $9y > 8z$



$2x$ is greater than or equal to $3y$ and $3x=4z$

This implies $6x$ is greater than or equal to $9y$ and $6x=8z \rightarrow 9y=8z$

So, $9y=8z$

So $9y>8z$ is incorrect

S2: $x(Q)2y$ and $y(R)Z$, then $x(R)z$

$x<2y$ and y is not greater than z , then x is not greater than z

$x<2y$ and y is not less than or equal to z , then x is less than or equal to z

this implies $x<2z$

ie., x may be/ may not be less than or equal to z

77. If in a certain code, 'ABCD' is written as 24 and 'EFGH' is written as 1680, then how is 'IJKL' written in that code?

(a) 11880

(b) 11240

(c) 7920

(d) 5940

• **Answer:** (a) 1180

• **Explanation:**

Given, ABCD= 24; ie, $1 \times 2 \times 3 \times 4 = 24$

EFGH= 168 ie., $5 \times 6 \times 7 \times 8 = 1680$



Therefore, $IJKL = 9 \times 10 \times 11 \times 12 = 11880$

78 If in a certain code, 'POT' is written as ATOP and 'TRAP' is written as APART, then how is 'ARENA' written in that code?

- (a) AARENA
- (b) AANREA
- (c) AANEAR
- (d) AANERA

- **Answer:** (d) AANERA
- **Explanation:** The pattern involves rearranging the letters by placing 'A' in front of the original word and then writing the rest of the word in reverse. So, ARENA becomes AANERA.

79. What will come in place of * in the sequence 3, 14, 39, 84, *, 258?

- (a) 150
- (b) 155
- (c) 160
- (d) 176

- **Answer:** (b) 155
- **Explanation:**
 $3 = 1^3 + 1^2 + 1$
 $14 = 2^3 + 2^2 + 2$
 $39 = 3^3 + 3^2 + 3$



Therefore, $53+52+5= 155$

80. In some code, letters P, Q, R, S, T represent numbers 4, 5, 10, 12, 15. It is not known which letter represents which number. If $Q - S = 2S$ and $T = R + S + 3$, then what is the value of $P + R - T$?

(a) 1

(b) 2

(c) 3

(d) Cannot be determined due to insufficient data

• **Answer:** (b) 2

• **Explanation:**

$$Q - 2S = S$$

$$Q = 3S$$

Therefore Q maybe 12 or 15 and S maybe 4 or 5.

Also,

$$T = R + S + 3$$

If $Q=12, S=4$, then $T=R+4+3$

$$T = R + 7$$

IF $Q=15, S=5, T=R+8$

ie., $12=4+8$

Therefore, $Q=15, S=5, T=12, R=4$

$$P + R - T = 10 + 4 - 12 = 2$$

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