Reasoning & General Mental Ability

1. What is the least possible number of cuts required to cut a cube into 64 identical pieces? **(2024)**

(a) 8 (b) 9

(c) 12 (d) 16

Ans : (b)

Explanation

- The least possible number of cuts required is 9.
- Let's break it down:
- First, make 3 cuts along the x-axis, dividing the cube into 8 equal parts.
- Then, make 3 cuts along the y-axis, dividing each of the 8 parts into 2 equal parts, resulting in 16 parts.
- Finally, make 3 cuts along the z-axis, dividing each of the 16 parts into 4 equal parts, resulting in 64 identical pieces.
- The total number of cuts required is 3 (along the x-axis) + 3 (along the y-axis) + 3 (along the z-axis) = 9 cuts.
- So, the least possible number of cuts required to cut a cube into 64 identical pieces is 9.
- **Hence, Option (b) is correct.**

2. In the expression 5 * 4 * 3 * 2 * 1, * is chosen from +,-, each at most two times. What is the smallest non-negative value of the expression? **(2024)**

(a) 3 (b) 2

(c) 1 (d) 0

Ans: (d)

Explanation

$5 - 4 - 3 + 2 \times 1$

$= 5 - 4 - 3 + 2$

$= 0$

Hence, Option (d) is correct.

3. On January 1st, 2023, a person saved ₹ 1. On January 2nd, 2023, he saved ₹ 2 more than that on the previous day. On January 3rd, 2023, he saved ₹ 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? **(2024)**

(a) 7th January, 2023 (b) 8th January, 2023

(c) 9th January, 2023 (d) Not possible

Ans: (b)

Explanation

- We'll calculate the savings for each day:
- January 1: Rs. 1
- January 2: Rs. 1 + Rs. 2 = Rs. 3
- January 3: Rs. 3 + Rs. 2 = Rs. 5
- January 4: Rs. 5 + Rs. 2 = Rs. 7
- January 5: Rs. 7 + Rs. 2 = Rs. 9
- January 6: Rs. 9 + Rs. 2 = Rs. 11
- January 7: Rs. 11 + Rs. 2 = Rs. 13
- January 8: Rs. 13 + Rs. 2 = Rs. 15
- The total savings done by the person by 8th January = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64
- We're looking for a number that is both a perfect square and a perfect cube. From our calculations, we see that the total savings on January 8 (Rs. 64) is both a perfect square (8^2) and a perfect cube (4^3).

Hence, Option (b) is correct.

4. Consider the sequence A_BCD_BBCDABC_DABC_D that follows a certain pattern. Which one of the following completes the sequence? **(2024)**

(a) B, A, D, C (b) B, A, C, D

(c) A, A, C, D (d) A, A, D, C

Ans: (c)

Explanation

- Divide the whole series into four groups in such a way that each group contains 5 letters and then check the pattern.
- The pattern followed here is:
- AABCD/ABBCD/ABCCD/ABCDD

Hence, Option (c) is correct.

5. 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? **(2024)**

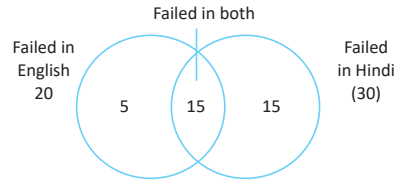
(a) 15% (b) 20%

(c) 25% (d) 35%

Ans: (b)

Explanation

- The least possible Venn diagram as per the given information is:



- Students that failed in only one subject = Students that failed in only English or those that failed in only Hindi = 5 +15 = 20% **Hence, Option (b) is correct.**

6. 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? **(2024)**

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

Ans: (a)

Explanation

- Let the age of father be X and the age of son be Y. According to the question, (X - n) = Y
  - X - Y = n .....(i)
  - And X = 4(Y - n)
  - Or X = 4Y - 4n
  - Or (4Y - X)/4 = n .....(ii)
- From equations (i) and (ii), we get:
  - X - Y = (4Y - X)/4
  - Or 4X – 4Y = 4Y - X
  - Or 5X = 8Y
  - Or X/Y = 8/5
  - Or we can say that,
  - X = 8k and Y = 5k
- Given that, X + Y = 130
  - Or 8k +5k = 130
  - Or 13k = 130
  - Or k = 10

So, age of father (X) = 8k = 80 years And age of son (Y) = 5k = 50 years

Difference in their ages = 80 – 50 = 30 years **Hence, Option (a) is correct.**

7. How many times the hour hand and the minute hand coincide in a clock between 10:00 a.m. and 2:00 p.m. (same day)? **(2024)**

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

Ans: (a)

Explanation

- Time frame: 10 a.m. to 2:00 p.m.
- Hour and minute hands coincide:
- 1 time between 10 a.m. and 11:00 a.m.
- 1 time between 11 a.m. and 1:00 p.m.
- 1 time between 1 p.m. and 2:00 p.m.

So, hour and minute hands coincide 3 times between 10:00 a.m. and 2.00 p.m. **Hence, Option (a) is correct.**

8. The calendar for the year 2025 is same for **(2024)**

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

Ans: (c)

Explanation

Let's calculate the number of odd days from 2025 till the number of odd days become 7.

YEAR	ODD DAYS
2025	1
2026	1
2027	1
2028(Leap Year)	2
2029	1
2030	1
TOTAL DAYS	7

So, year 2031 will have the same calendar as that of 2025. **Hence, Option (c) is correct.**

9. What is the angle between the minute hand and hour hand when the clock shows 4:25 hours? **(2024)**

(a) 12.5° (b) 15°
(c) 17.5° (d) 20°

Ans: (c)

Explanation

- Time = 4 : 25
- Minute hand moves 6o per minute.
- So, Angle traced by minutes hand in 25 minutes = 25 × 6o = 150o 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 × 0.5 o = 132.5o
- Thus, the angle between two hands at 4 : 25 = 150o - 132.5o = 17.5o **Hence, Option (c) is correct.**

10. What is the sum of the first 28 terms in the following sequence? **(2024)**

1, 1, 2, 1, 3, 2, 1, 4, 3, 2, 1, 5, 4, 3, 2, ...

(a) 83 (b) 84

(c) 85 (d) 86

Ans: (b)

Explanation

The sequence is structured such that:

1. The first term is 1.
2. The next two terms are 1, 2.
3. The next three terms are 1, 2, 3.
4. The next four terms are 1, 2, 3, 4.
5. And so on.

- Group 1: 1 = 1
- Group 2: 1 + 2 = 3
- Group 3: 1 + 2 + 3 = 6
- Group 4: 1 + 2 + 3 + 4 = 10
- Group 5: 1 + 2 + 3 + 4 + 5 = 15
- Group 6: 1 + 2 + 3 + 4 + 5 + 6 = 21
- Group 7: 1 + 2 + 3 + 4 + 5 + 6 + 7 = 28
- Series with 28 terms: 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
- Total sum of the first 7 groups: 1 + 3 + 6 + 10 + 15 + 21 + 28 = 84
- Their sum = 84

Hence, Option (b) is correct.

11. 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: **(2024)**

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

Ans: (c)

Explanation

We're given that 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.

- Mathematically, this can be expressed as: [4O + 6M + 8A = 2(1O + 2M + 5A)] where (O), (M), and (A) represent the costs of one orange, one mango, and one apple, respectively.

  Simplifying the equation:

- [4O + 6M + 8A = 2O + 4M + 10A] [2O + 2M = 2A] [O + M = A]
- This tells us that the cost of one orange plus the cost of one mango equals the cost of one apple.
- Now let's consider the statements:

  Statement 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.

  Let's check if this is true:

  [3O + 5M + 9A = 4O + 6M + 8A] [O + M = A] (which we already know from the given information) **So, statement 1 is correct.**

  Statement 2: The total cost of one orange and one mango is equal to the cost of one apple.

  We already established this relationship earlier: (O + M = A). **Therefore, statement 2 is also correct.**

  Since both statements are correct.

Hence, Option (c) is correct.

12. 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? **(2024)**

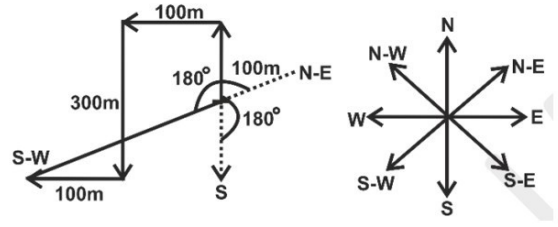
(a) North-West (b) West

(c) South (d) South-West

Ans: (c)

Explanation

If the person initially walked in the north direction, we can illustrate their path based on the information given in the question.



Based on the information provided in the question, the office should be in the northeast (N-E) direction from the house. However, in our diagram, it is located in the southwest (S-W) direction. To correct this, we need to rotate our diagram by 180° either clockwise or counterclockwise. As a result, the north direction in our diagram will become the south direction.

Hence, Option (c) is correct.

13. 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? **(2024)**

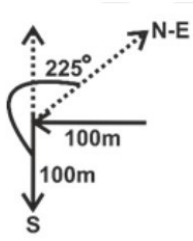
(a) South-West (b) South-East

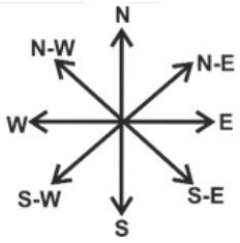
(c) North-West (d) North-East

Ans: (d)

Explanation

Based on the information given in the question, we can create the following diagram.





So, his final direction will be the North-East. **Hence, Option (d) is correct.**

14. A Statement is given followed by two Conclusions numbered I and II. Consider the Statement and the Conclusions. **(2024)**

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-1 follows

(b) Only Conclusion-II follows

(c) Both Conclusion-I and Conclusion-II follow

(d) Neither Conclusion-I nor Conclusion-II follows

Ans: (d)

Explanation

The correct answer is **Neither Conclusion-I nor Conclusion-II follows**. India is indeed the world's largest producer of milk, contributing 24% of global milk production1. However, this information alone does not imply that India is the largest exporter of milk or that it does not import milk. The conclusions are not directly supported by the given statement. **Hence, Option (d) is correct.**

15. A Question is given followed by two Statements I and II. Consider the Question and the Statements. **(2024)**

What are the values of m and n where m numbers? and are natural **Statement-I**: m + n > mn and m > 1.

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 beanswered 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 beanswered using either Statement alone

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

Ans: (c)

Explanation

Let's consider each statement individually:

Statement I:

We have (m + n > mn).

Since (m > 1), we can rewrite this as (m(n - 1) < n).

This implies that (m) must be less than (n).

Statement II:

The product of (m) and (n) is 24: (mn = 24).

We know that (m) and (n) are natural numbers, so we need to find pairs of natural numbers whose product is 24.

Possible pairs: (1, 24), (2, 12), (3, 8), (4, 6).

Now let's combine both statements:

From Statement I, we know that (m < n).

From Statement II, we have possible pairs for (m, n): (2, 12) and (3, 8).

Since both statements together allow us to determine valid pairs of (m, n). **Hence, Option (c) is correct.**

16. A Question is given followed by two Statements 1 and II. Consider the Question and the Statements. **(2024)**

Question: What is the time required 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 beanswered 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 beanswered using either Statement alone

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

Ans: (c)

Explanation

Let's break down the problem and analyse the statements:

Statement I: The size of the software is 12 megabytes.

Statement II: The transfer rate is 2-4 kilobytes per second.

We want to find the time required to download the software. To do this, we need both the size of the software and the transfer rate. Let's consider each statement:

Statement I: Knowing the size of the software (12 megabytes) is essential for calculating the download time. However, it alone doesn't provide the transfer rate.

Statement II: The transfer rate (2-4 kilobytes per second) is crucial information. But without the software size, we can't determine the total time.

Now let's combine both statements:

With both the software size and the transfer rate, we can calculate the download time.

Hence, Option (c) is correct.

17. What are the unique values of x and y, where x, y are distinct natural numbers? **(2024)**

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

Ans: (c)

Explanation

- Let's consider each statement individually:
- Using statement-I alone:
- x/y = odd
- 3/1 = 3
- 6/2 = 3 .....and so on.
- This statement alone is not sufficient, as so many possibilities are there.
- Using statement-II alone: xy = 12
- The values of x and y may be 12 & 1, 4 & 3, or 6 & 2.
- So, this statement alone is also not sufficient.
- On combining statement-I and statement-II:
- 12/1 = 12, which is not odd.
- 4/3 is a fraction.
- Now, 6/2 = 3, which is an odd number.
- Hence, unique values of x and y are 6 and 2 respectively.
- So, the question can be answered by using both the statements together but cannot be answered using either statement alone. **Hence, Option (c) is correct.**

18. A certain amount was distributed among X, Y and Z. Who received the least amount? **(2024)**

Statement-I: X received 4/5 of what Y and Z together received.

Statement-II: Y received 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 beanswered 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 beanswered using either Statement alone

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

Ans: (c)

Explanation

Neither statement alone can determine who received the least amount.

Statement I: Only tells us that X received a larger portion compared to Y and Z combined.

We don't know the relative amounts between Y and Z.

= (4/5) (Y + Z)

5X = 4Y + 4Z .....(1)

Statement II: Similarly, only tells us that Y received a smaller portion compared to X and Z combined. We don't know the relative amounts between X and Z.

A = (2/7) (X + Z)

7Y= 2X + 2Z

After multiplying by 2, we get:

14Y= 4X + 4Z .....(2)

However, using both statements together, we can deduce the relation.

On subtracting equation (2) from equation (1), we get:

9X = 18Y

X = 2Y

∴X > Y.....(3)

After putting the value of X in equation (2), we get:

7Y = 4Y + 2Z

3Y = 2Z

Z = 1.5 Y

∴Z > Y.....(4)

On Combining these inequalities (3 and 4), we can conclude that **Y received the least amount.**

Important Note: This solution relies on the assumption that the amounts distributed are positive. If any amount could be negative, the answer might change. **Hence, Option (c) is correct.**

19. What are those three numbers? **(2024)**

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 beanswered 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 beanswered using either Statement alone

(d) The Question cannot be answered even by using both the Statements together**Correct Answer : A**

Explanation

Let's analyse the statements:

Statement-I: Their sum is less than 23.

Considering prime numbers less than 23, we can determine that the three distinct prime numbers that satisfy the conditions are 3, 5, and 11 (3 + 5 + 11 = 19 < 23).

Thus, Statement I alone provided the enough information to answer the question.

Statement-II: One of the numbers is 5.

5 + 7 + 11 = 23 (a prime number)

5 + 11 + 13 = 29 (a prime number)

By relying solely on Statement II, we cannot deduce a distinct set of prime numbers.

So, the Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone. **Hence, Option (a) is correct.**

20. A person buys three articles p, q and r for 50. The price of the article q is 16 which is the least. What is the price of the article p? **(2024)**

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 beanswered 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 beanswered using either Statement alone

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

Ans: (c)

Explanation

Let's analyse the statements:

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

This implies that P ≤ r

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

This implies that r ≤ P

By combining these two statements: P ≤ r

r ≤ P

This means p = r.

From the given information:

p + q + r = 50 Since q = 16: p + 16 + r = 50 And p = r: p + 16 + p = 50

2p + 16 = 50 2p = 34

p = 17

Therefore, by using both statements together, we can determine the price of article p. **Hence, Option (c) is correct.**

21. P, Q, R and S appeared in a test. Has P scored more marks than Q? **(2024)**

Statement-I: The sum of the marks scored by P and Q is equal to the sum of the marks scored by Rand S.

Statement-II: The sum of the marks scored by P and Sis 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 beanswered 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 beanswered using either Statement alone

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

Ans: (d)

Explanation

Let's analyse the statements:

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.

This means P + Q = R + 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.

This means P + S > Q + R

On substituting R+S from Statement I into Statement II, we get:

P + S > Q + (P + Q − S)

P + S > P + 2Q – S

2S > 2Q

S > Q

Since S > Q does not directly tell us if P scored more than Q, we need to consider the entire system of equations.

Let's test the information for different relative values:

Given that S > Q and knowing P + Q = R + S

Suppose R = P and S = Q, then P + Q = P + Q would be true, but P + S > Q + R would not be possible because P + Q is equal.

Thus, even with S > Q, it is not necessarily clear from the combined information whether P scored more than Q. It only tells us about the relation between S and Q.

Therefore, we can't definitively conclude that P scored more than Q with the given information.

So, the Question cannot be answered even by using both the Statements together. **Hence, Option (d) is correct.**

22. 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. **(2024)**

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 beanswered 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 beanswered using either Statement alone

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

Ans: (a)

Explanation

We have been given that age of P and Q is less than 100 but more than 10. It implies that both P and Q are two-digit numbers.

∴10 < P, Q < 100

Also, let P = xy, then Q = yx

Now, let's analyse the statements:

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

P > Q

There are various possibilities:

81 > 18

72 > 27 …. and so on.

So, it alone is not sufficient.

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

P + Q = (11/6) (P - Q)

10x + y + 10y + x = (11/6) (10x + y – 10y - x)

11(x + y) = (11/6) (9x – 9y)

6(x + y) = 9 (x - y) 2x + 2y = 3x – 3y

x = 5y

As, x and y must be one-digit numbers, y must be 1 and x therefore must be 5. ∴ P = 51 and Q = 15

∴ difference in their ages = P – Q = 51 – 15 = 36 years

So, statement-II alone is sufficient to answer this question.

Hence, Option (a) is correct.

23. A 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

Ans: (c)

Explanation

Let's analyse the statements in relation to the 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.

We need to find pairs where the first statement implies the second and both are consistent with the main statement.

SP (S implies P): If Pradeep is not a Producer (S), it implies he must be a Director (P) because he has to be either a Director or a Producer. This pair is consistent with the main statement.

RQ (R implies Q): If Pradeep is not a Director (R), it implies he must be a Producer (Q) because he has to be either a Director or a Producer. This pair is also consistent with the main statement.

So, the correct answer is **Both SP and RQ.**

Hence, Option (c) is correct.

24. If a + b means a – b; a – b means a × b; a × b means a ¸ b, a ¸ b means a + b, then what is the value of 10 + 30 – 100 × 50 ¸ 25? (Operations are to be replaced simultaneously)

(a) 15 (b) 0

(c) – 15 (d) – 25

Ans: (d)

Explanation

On Changing the mathematical signs according to the given instructions, we get:

10 – 30 × 100 ¸ 50 + 25

= 10 –30 × 2 + 25

= 10 – 60 + 25

= 35 – 60

= -25

Hence, Option (d) is correct.

25. If P means 'greater than (>)'; Q means less than (<)'; R means 'not greater than (>)'; S means 'not less than (t)' 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

Ans:(d)

Explanation

Let's analyse the statements:

Statement 1: If 2x (S) 3y and 3x (T) 4z, then 9y (P) 8z.

Convert the symbols:

2x (S) 3y means 2x ≥ 3y

3x (T) 4z means 3x = 4z Given:

2x ≥ 3y

3x = 4z

We need to show 9y (P) 8z, which means 9y > 8z.

From 3x = 4z

Substitute x into 2x ≥ 3y:

2 (4z/3) ≥ 3y

8z ≥ 9y

9y ≤ 8z

Thus, 9y >8z is not true.

So, Statement 1 is incorrect.

Statement 2: If x (Q) 2y and y(R)z, then x(R)z.

Convert the symbols: x (Q) 2y means x < 2y

y (R) z means y ≤ z Given: x < 2y

y ≤ zy

We need to show x (R) z, which means x ≤ z.

From y ≤ z, we know that y is at most z:

x < 2y

x < 2z

Since x < 2z, it doesn't directly give x ≤ z.

However, since x is less than twice y and y is at most z, x ≤ z could be inferred depending on the values, but

it's not strictly guaranteed by the given information. Therefore, Statement 2 does not conclusively prove x ≤ z.

Hence, Option (d) is correct.

Ans: (a)

Explanation

The concept followed here is that **Letter is coded by its positional value.**

Positional Value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional Value	26	25	24	23	22	21	20	19	18	17	16	15	14

The logic followed here is:

ABCD' is written as 24

1 × 2×3 × 4 = 24

EFGH is written as 1680

5 × 6 × 7 ×8 = 1680

Similarly, IJKL will be written as 11880.

9 × 10 ×11 × 12 = 11880

Hence, Option (a) is correct.

27. 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

Ans: (d)

Explanation

The logic followed here is:

"The word is being reversed and prefix 'A' is being added to the front." POT is written as ATOP.

Reverse order of POT = TOP

So, the code of POT will be 'ATOP'.

TRAP is written as APART.

Reverse order of TRAP = PART

So, the code of TRAP will be APART.

Similarly, ARENA will be written as AANERA.

Reverse order of ARENA = ANERA So, the code of ARENA will be 'AANERA'.

Hence, Option (d) is correct.

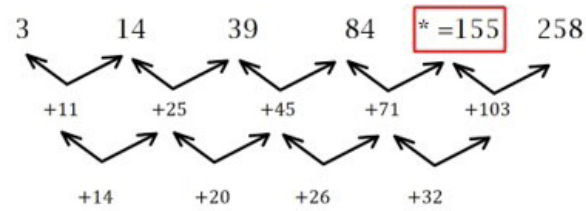
28. What will come in place of * in the sequence 3, 14, 39, 84, *, 258?

(a) 150 (b) 155

(c) 160 (d) 176

Ans: (b)

Explanation



Hence, Option (b) is correct.

29. 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

Ans: (b)

Explanation

- We are given the following conditions:
- Q-S=2S
- & T=R + S + 3
- Let's analyze the first condition:
- Q–S=2S
- Q=3S
- The possible numbers are 4, 5, 10, 12, and 15. Since Q must be three times S, we need to find two numbers from this set such that one is three times the other.
- Checking the possible values:
- If S=4, Q=3×4=12
- If S=5, Q=3×5=15
- These are the only two pairs that satisfy Q=3S.

- Next, let's analyze the second condition with the pairs identified: T=R+S+3
- Case 1: S=4 and Q=12
- The remaining numbers are 5, 10, and 15.
- We need T=R+4+3, which simplifies to T=R+7.
- Let's consider the remaining possible values of R:
- If R=5, then T=5+7=12. However, Q is already 12, so this is not possible.
- If R=10, then T=10+7=17. But 17 is not in the list, so this is not possible.
- If R=15, then T=15+7=22. But 22 is not in the list, so this is not possible.
- Hence, S=4 and Q=12 is not a valid pair.
- Case 2: S=5 and Q=15
- The remaining numbers are 4, 10, and 12.
- We need T=R+5+3, which simplifies to T=R+8.
- Let's consider the remaining possible values of R:
- If R=4, then T=4+8=12. This is valid since 12 is in the list.
- If R=10, then T=10+8=18. But 18 is not in the list, so this is not possible.
- If R=12, then T=12+8=20. But 20 is not in the list, so this is not possible.
- Thus, R=4 and T=12 is a valid pair.
- Now we have:
- S=5
- Q=15
- R=4
- T=12
- The remaining number is 10, so P=10.
- We now need to find P+R−T:
- => P+R−T=10+4−12=2
- So, the value of P+R−T is 2.

Hence, Option (b) is correct.

30. 125 identical cubes are arranged in the form of a cubical block. How many cubes are surrounded by other cubes from each side? **(2023)**

(a) 27 (b) 25

(c) 21 (d) 18

Ans: (a)

Explanation

- We have to find the hidden cube which is not exposed. Let the side of the cube is 'n'.
- According to the question, we have 125 identical cubes.

  $\Rightarrow \sqrt[3]{125} = 5$. Therefore $n = 5$
- The formula to find number of hidden cubes is $(n-2)^3$
- Now, $(n-2)^3 = (5-2)^3 = 27$
- **Therefore, option (a) is the correct answer.**

31. How many distinct 8-digit numbers can be formed by rearranging the digits of the number 11223344 such that odd digits occupy odd positions and even digits occupy even positions? **(2023)**

(a) 12 (b) 18

(c) 36 (d) 72

Ans: (c)

Explanation

- In the given 8-digit number 11223344, 4 are even and 4 are odd.
- All the 4 odd numbers can be arranged in 4 odd places in the following number of ways = $\frac{4!}{2\times 2} = 6$
- All the 4 even numbers can be arranged in 4 even places in the following number of ways = $\frac{4!}{2\times 2} = 6$
- Therefore, total number of distinct numbers can be formed are $6 \times 6 = 36$
- **Therefore, option (c) is the correct answer.**

32. If $7 \oplus 9 \oplus 10 = 8$, $9 \oplus 11 \oplus 30 = 5$, $11 \oplus 17 \oplus 21 = 13$, what is the value of $23 \oplus 4 \oplus 15$?

(a) 6 (b) 8

(c) 13 (d) 15

Ans (a)

Explanation

- We need to replace "⊕" with a mathematical operator. Simply adding all the numbers and subsequently adding the digit we can get the result.

  $\Rightarrow 7 \oplus 9 \oplus 10 = 7 + 9 + 10 = 26 = 2 + 6 = 8$

  $\Rightarrow 9 \oplus 11 \oplus 30 = 9 + 11 + 30 = 50 = 5 + 0 = 5$

  $\Rightarrow 11 \oplus 17 \oplus 21 = 11 + 17 + 21 = 49 = 4 + 9 = 13$
- So, $23 \oplus 4 \oplus 15 = 23 + 4 + 15 = 42 = 4 + 2 = 6$
- **Therefore, option (a) is the correct answer.**

33. A box contains 14 black balls, 20 blue balls, 26 green balls, 28 yellow balls, 38 red balls and 54 white balls. Consider the following statements : **(2023)**

1. The smallest number n such that any n balls drawn from the box randomly must contain one full group of at least one colour is 175.
2. The smallest number m such that any m balls drawn from the box randomly must contain at least one ball of each colour is 167.

Which of the above statements is/are correct?

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Explanation

- In the given question the box contains 14 black balls, 20 blue balls, 26 green balls, 28 yellow balls, 38 red balls, and 54 white balls.
- **Statement 1:** According to the statement to find the smallest number of ways in which 'n' balls are drawn contains one full color, we need to consider the worst-case scenario. Suppose the ball is drawn in the following manner: 13 black balls + 19 blue balls + 25 green balls + 27 yellow balls + 37 red balls + 53 white balls + the next ball will complete the set of any color ball which was left. Therefore, the least value of 'n' = 13+ 19+ 25+ 27+ 37+ 53+ 1 = 175. **Hence, it is correct.**
- **Statement 2:** To find the number of ways in which the ball is drawn randomly contains at least one ball of each color, here we need to look at the worst-case scenario. For this we need to find out the maximum number of ways in which at least one-color ball is absent.
- Since the black balls are least in number, we can draw the most balls without getting a black one. Hence, we will choose 20 blue balls, 26 green balls, 28 yellow balls, 38 red balls, and 54 white balls. This gives the value of m = 20 + 26 + 28 + 38 + 54 + 1 = 167. **Hence, it is correct. Therefore, option (c) is the correct answer.**

34. If 'ZERO' is written as `CHUR', then how is `PLAYER' written? **(2023)**

(a) SOCAGT (b) SODBGT

(c) SODBHT (d) SODBHU

Ans: (d)

Explanation

- In this question, we need to figure out the pattern.
- It is given that "ZERO" is written as "CHUR". We can see that there is a simple pattern below.

A	B	C	D	E	F
1	2	3	4	5	6
G	H	I	J	K	L
7	8	9	10	11	12
M	N	O	P	Q	R
13	14	15	16	17	18
S	T	U	V	W	X
19	20	21	22	23	24
Y	Z				
25	26				

$\Rightarrow Z + 3 = C$

$\Rightarrow E + 3 = H$

$\Rightarrow R + 3 = U$

$\Rightarrow O + 3 = R$

- We need to follow a similar pattern for the word PLAYER.

$\Rightarrow P + 3 = S$

$\Rightarrow L + 3 = O$

$\Rightarrow A + 3 = D$

$\Rightarrow Y + 3 = B$

$\Rightarrow E + 3 = H$

$\Rightarrow R + 3 = U$

- Thus, the obtained answer is SODBHU. **Therefore, option (d) is the correct answer.**

35. Consider the following statements : **(2023)**

1. A is older than B.
2. C and D are of the same age.
3. E is the youngest.
4. F is younger than D.
5. F is older than A.

How many statements given above are required to determine the oldest person/persons?

(a) Only two (b) Only three

(c) Only four (d) All five

Ans: (d)

Explanation

- To determine the oldest person in the given question, we need to arrange the information in ascending or descending order.
- **Statement 1:** A > B
- **Statement 2:** C = D
- **Statement 3:** E is the youngest
- **Statement 4:** F < D
- **Statement 5:** F > A
- So, arranging the given statements: C = D > F > A > B > E
- Hence, we can see all 5 statements are required to answer the question. **Therefore, option (d) is the correct answer.**

36. 39. Consider the following including the Question and the Statements : **(2023)**

There are 5 members A, B, C, D, E in a family.

Question : What is the relation of E to B?

Statement-1 : A and B are a married couple.

Statement-2 : D is the father of C.

Statement-3 : E is D's son.

Statement-4 : A and C are sisters.

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

(a) Statement-1, Statement-2 and Statement-3 are sufficient to answer the Question.

(b) Statement-1, Statement-3 and Statement-4 are sufficient to answer the Question.

(c) All four statements together are sufficient to answer the Question.

(d) All four statements are not sufficient to answer the Question.

Ans: (c)

Explanation

- There are 5 members in the family namely: A, B, C, D, E.
- From Statement 4: A & C are sister's i.e., A is a female.
- Therefore, from Statement 1: B is husband & A is wife.
- From Statement 2: D is father of C and since A and C are sisters then D is also the father of A.
- From Statement 3: E is the son of D, i.e., E is brother of A and brother-in-law of B.
- Thus, we can see all the four statements are required to answer the questions. **Therefore, option (c) is the correct answer.**

37. Choose the group which is different from the others : **(2023)**

(a) 17, 37, 47, 97 (b) 31, 41, 53, 67

(c) 71, 73, 79, 83 (d) 83, 89, 91, 97

Ans: (d)

Explanation

METHOD I

$\Rightarrow$ 17, 37, 47, 97 ...(1)

$\Rightarrow$ 31, 41, 53, 67 ...(2)

$\Rightarrow$ 71, 73, 79, 83 ...(3)

$\Rightarrow$ 83, 89, 91, 97 ...(4)

- Only 91 is a composite number in series (4) and the rest of all other numbers are prime. **Hence, it is correct.**

METHOD II:

$\Rightarrow$ 17, 37, 47, 97 ...(1)

$\Rightarrow$ 31, 41, 53, 67 ...(2)

$\Rightarrow$ 71, 73, 79, 83 ...(3)

$\Rightarrow$ 83, 89, 91, 97 ...(4)

- Difference between the consecutive term is: 37–17 = 20; 47– 37 = 10; 97– 47 = 50
- 20, 10, 50
- The difference between the consecutive terms of the other series will be:

$\Rightarrow$ 10, 12, 14

$\Rightarrow$ 2, 6, 4

$\Rightarrow$ 6, 2, 6

- We can see that all the series contain different numbers but series 4 has repetition of 6. **Therefore, option (d) is the correct answer.**

38. In how many ways can a batsman score exactly 25 runs by scoring single runs, fours and sixes only, irrespective of the sequence of scoring shots? **(2023)**

(a) 18 (b) 19

(c) 20 (d) 21

Ans: (b)

Explanation:

- Let the singles, the fours and the sixes scored by the batsman be a, b and c respectively.

  $\Rightarrow$ According to question: $a + 4b + 6c = 25$, where $a, b, c \geq 0$
- If four sixes have been hit, i.e., c = 4

  $\Rightarrow a + 4b + 6c = 25$
- So, the possible values of (a, c) may be (1, 4), i.e., 1 possible way.
- If three sixes have been hit, i.e., c = 3

  $\Rightarrow a + 4b + 6c = 25$
- So, the possible values of (a, b, c) may be (3, 1, 3), (7, 0, 3), i.e., 2 possible ways.
- If two sixes have been hit, i.e., c = 2

  $\Rightarrow a + 4b + 6c = 25$
- So, the possible values of (a, b, c) may be (1, 3, 2), (5, 2, 2), (9, 1, 2), (13, 0, 2), i.e., 4 possible ways.
- If one six has been hit, i.e., c = 1

  $\Rightarrow a + 4b + 6c = 25$
- So, the possible values of (a, b, c) may be (3, 4, 1), (7, 3, 1), (11, 2, 1), (15, 1, 1), (19, 0, 1), i.e., 5 possible ways.
- If no six has been hit, i.e., c = 0

  $\Rightarrow a + 4b + 6c = 25$
- So, the possible values of (a, b, c) may be (1, 6, 0), (5, 5, 0), (9, 4, 0), (13, 3, 0), (17, 2,0), (21, 1,0), (25, 0, 0), i.e., 7 possible ways.
- Therefore, total number of possible ways = 7 + 5 + 4 + 2 + 1 = 19. **Therefore, option (b) is the correct answer.**

39. There are four letters and four envelopes and exactly one letter is to be put in exactly one envelope with the correct address. If the letters are randomly inserted into the envelopes, then consider the following statements : **(2023)**

1. It is possible that exactly one letter goes into an incorrect envelope.

2. There are only six ways in which only two letters can go into the correct envelopes.

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

Ans: (b)

Explanation:

- **Statement 1:** According to the statement if one of the letter is placed in an incorrect envelope, then the letter that belonged to that envelope must have also been placed in an incorrect envelope. Therefore, it is not possible that exactly one letter is misplaced, it must be at least two letters which got into the wrong envelope. **Hence, it is not correct.**
- **Statement 2:** The number of ways in which 2 letters can be placed in correct envelopes can be found by ${}^4C_2$ which gives 6 ways. **Hence, it is correct. Therefore, option (b) is the correct answer.**

40. Raj has ten pairs of red, nine pairs of white and eight pairs of black shoes in a box. If he randomly picks shoes one by one (without replacement) from the box to get a red pair of shoes to wear, what is the maximum number of attempts he has to make? **(2023)**

(a) 27 (b) 36

(c) 44 (d) 45

Ans: (d)

Explanation:

- Raj has a total of 20 red shoes, 18 white shoes, and 16 black shoes. The worst-case scenario is if he draws all the white and black shoes first, which would take 18 + 16 = 34 attempts.
- After that, any two shoes he draws will be red, but he needs to draw 11 red shoes to get a pair. Because for the first 10 shoes drawn, he may get all the shoes for same leg. Therefore, the maximum number of attempts to get a red pair of shoes is 34 + 11 = 45. **Therefore, option (d) is the correct answer.**

41. What is the number of selections of 10 consecutive things out of 12 things in a circle taken in the clockwise direction? **(2023)**

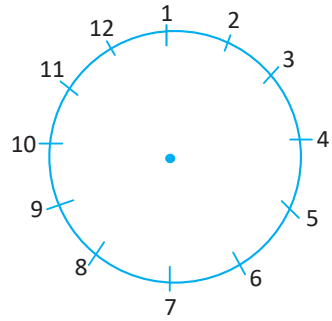
(a) 3 (b) 11

(c) 12 (d) 66

Ans : (c)

Explanation:

- If we count from 1 to 10 then we get the 1st consecutive set.
- Secondly, we count from 2 onwards and we get 10 consecutive required set till 11.
- 3rd set of the required pattern comes out when we count from 3 to 12.
- Similarly, we get required sets counting from 4 to 1 i.e., 4, 5, 6, 7, 8, 9, 10, 11, 12, 1
- Counting all such possible ways and since repetition is not restricted, there can be 12 such possible ways i.e., 5 to 2, 6 to 3, 7 to 4, 8 to 5, 9 to 6, 10 to 7, 11 to 8, 12 to 9.
- Hence, required answer is 12. **Therefore, option (c) is the correct answer.**



42. If today is Sunday, then which day is it exactly on 10^{10} th day? **(2023)**

(a) Wednesday (b) Thursday

(c) Friday (d) Saturday

Ans: (b)

Explanation:

- Today's day = Sunday
- 10^{10th} = 10000000000
- Dividing 10^{10} by 7, we get, remainder = 4 i.e., odd day = 4
- If today is Sunday, then 10^{10th} day will be 4 days after Sunday i.e., Thursday. **Therefore option (b) is the correct answer.**

43. There are three traffic signals. Each signal changes colour from green to red and then from red to green. The first signal takes 25 seconds, the second signal takes 39 seconds and the third signal takes 60 seconds to change the colour from green to red. The durations for green and red colours are same. At 2:00 p.m, they together turn green. At what time will they change to green next, simultaneously? **(2023)**

(a) 4:00 p.m. (b) 4:10 p.m.

(c) 4:20 p.m. (d) 4:30 p.m.

Ans: (b)

Explanation:

- Time taken by 1st signal to change colour = 25 seconds
- Time taken by 2nd signal to change colour = 39 seconds
- Time taken by 3st signal to change colour = 60 seconds
- At 2:00 p.m, all the three signals turn green together.
- L.C.M of 25, 39 and 60 = 5 × 3 × 2 × 5 × 13 × 2

  = 3900 Seconds

  $= \frac{3900}{60}\text{minutes}\left[\because 1\,\text{minute} = 60\,\text{seconds}\right]$

  = 65 minutes
- Signals will change colours simultaneously to red after 65 minutes i.e., at 3:05 p.m signals will turn red together. And again 65 minutes later i.e., 4 :10 p.m the signals will turn green again. **Therefore, option (b) is the correct answer.**

44. 40 children are standing in a circle and one of them (say child-1) has a ring. The ring is passed clockwise. Child-1 passes on to child-2, child-2 passes on to child-4, child-4 passes on to child-7 and so on. After how many such changes (including child-1) will the ring be in the hands of child-1 again? **(2023)**

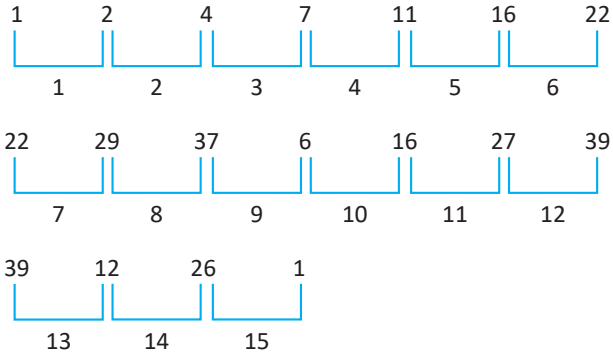
(a) 14 (b) 15

(c) 16 (d) 17

Ans: (b)

Explanation:

- According to the given question the ring is passed from child 1 to child 2 and further to child 4 followed by child 7 and so on in a clockwise manner.



- Hence, we can see that after 15 changes the ring will again be in the hands of child 1. **Therefore, option (b) is the correct answer.**

45. What is the middle term of the sequence Z, Z, Y, Y, Y, X, X, X, X, W, W, W, W, W, . . ., A? **(2023)**

(a) H (b) I

(c) J (d) M

Ans: (b)

Explanation:

- The given expression in the question is example of palindrome series: Z, Z, Y, Y, Y, X, X, X, X, W, W, W, W, W, ..., A
- The pattern of above series is 2, 3, 4, ... 27.
- So, the number of terms in the given sequence can be found by $\frac{n(n+1)}{2}-1=\frac{27(27+1)}{2}-1 = 378-1 = 377.$
- Hence, the middle term of the sequence is $\frac{n+1}{2}=\frac{377+1}{2}=189^{\text{th}}$ term
- Given that A is repeated 27 times, B is repeated 26 times, and so on, until H is repeated 20 times, we can calculate the total number of terms covered by the pattern so far: 27 + 26 + 25 + 24 + 23 + 22 + 21 + 20 = 188 terms
- Since we are looking for the 189th term, which falls right after this pattern, the next letter in the sequence would be I. So, the 189th term in the sequence is I. **Therefore, option (b) is the correct answer.**

46. In a party, 75 persons took tea, 60 persons took coffee and 15 persons took both tea and coffee. No one taking milk takes tea. Each person takes at least one drink. **(2023)**

Question : How many persons attended the party?

Statement-1 : 50 persons took milk.

Statement-2 : Number of persons who attended the party is five times the number of persons who took milk only.

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.

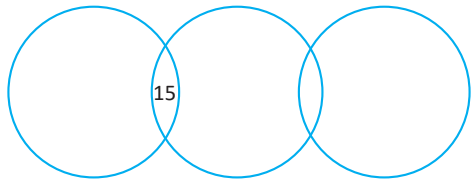
(c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone.

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

Ans: (a)

Explanation:

- According to the question: In a party, 75 persons took tea, 60 persons took coffee, and 15 persons took both tea and coffee, no one taking milk takes tea. Each person takes at least one drink.
- To have a better understanding of the question we can represent it through Venn Diagram:



- Let the number of persons taking only milk be 'x' and person taking both milk and coffee be 'y'.
- We can conclude from the given information that:
- Number of persons taking tea = 75
- Number of persons taking only coffee $\Rightarrow$ 60 – 15 – y = 45 – y
- Therefore, total number of members attending party are = 75 + 45 + x
- Now, examining the given statement we obtain that:
- **Statement 1:** 50 persons took milk.
- So, if x + y = 50. This method does not provide us with the total count of people who attended the party. We don't know what 'y' is equal to.
- Therefore, statement 1 alone is not sufficient to answer the question.
- **Statement 2:** Number of persons who attended the party is five times the number of persons who took milk only.
- If 120 + x = 5x
- Then, x = 30
- Therefore, total number of persons in the party will be = 120 + 30 = 150
- Hence, statement 2 alone can answer the question. **Therefore, option (a) is the correct answer.**

47. For five children with ages a < b < c < d < e; any two successive ages differ by 2 years. **(2023)**

Question : What is the age of the youngest child?

Statement-1 : The age of the eldest is 3 times the youngest.

Statement-2 : The average age of the children is 8 years.

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.

Ans: (b)

Explanation:

- For five children with ages a < b < c < d < e; the given condition in the question is: Any two successive ages differ by 2 years.
- Let age of youngest member be "a" then the age of consecutive members will be a+2, a+4, a+6, a+8.
- **Statement 1:** The age of the eldest is 3 times the youngest.

  $3a = a + 8$

  $\Rightarrow a = 4$
- Hence, statement 1 is enough to answer the question.
- **Statement 2:** The average age of the children is 8 years

  $\Rightarrow \frac{a+a+2+a+4+a+6+a+8}{5} = 8$

  $\Rightarrow a + a + 2 + a + 4 + a + 6 + a + 8 = 8 \times 5$

  $\Rightarrow 5a + 20 = 8 \times 5$

  $\Rightarrow a = 4$
- Hence, Statement 2 can also answer the question independently. **Therefore, option (b) is the correct answer.**

48. In an examination, the maximum marks for each of the four papers namely P, Q, R and S are 100. Marks scored by the students are in integers. A student can score 99% in n different ways. What is the value of n? **(2023)**

(a) 16 (b) 17

(c) 23 (d) 35

Ans: (d)

Explanation:

- Total marks of each paper = 100
- Total number of papers = 4
- Total marks = 4 × 100 = 400
- To obtain 99%, a student has to get 99 × 4 = 396 marks out of 400 i.e., he/she has to lose 4 marks in total.
- The different possibilities in which a student loses 4 marks in 4 papers may be written as:
  1. Suppose he/she loses 4 marks in one paper & 0 marks in rest of 3 papers.
- So number of ways in which he/she loses 4 marks in rest paper & 0 in 3 each can be written as ${}^4p_1$ i.e, $\frac{4!}{(4-1)!} = 4$
  2. Suppose he loses 3 marks in one paper & 1 mark in another paper; and 0 each in rest 2 papers.
- Number of ways in which above condition can be fulfilled as ${}^4p_1 \times {}^3p_1 = \frac{4!}{(4-1)!} \times \frac{3!}{(3-1)!} = \frac{4!}{3!} \times \frac{3!}{2!} = 4 \times 3 = 12$
  3. Suppose the student loses 2 marks each in two papers and 0 each in rest two.

- Number of ways in which above condition is fulfilled is

$${}^4p_2 = \frac{4!}{(4-2)!} = \frac{4!}{2!} = 6$$

4. Suppose the student loses 2 marks in one subject and one marks each in two subjects & 0 marks in one subject.

- Number of ways of such possibilities is ${}^4p_2$ i.e., $= \frac{4!}{2!} = 6$
- [Alternatively we can find the probability of having 2 marks loss in one paper & 0 mark in one]

5. Suppose the student loses one marks each in each subject.

- The number of ways in which this condition can be fulfilled is 1. [∵ Only in one way a student get 99 marks in all 4 subjects]
- Hence, total number of ways in which the student can score 99% is 4 + 12 + 6 + 12 + 1 = 35
- **Therefore, option (d) is the correct answer.**

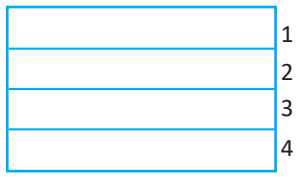
49. A flag has to be designed with 4 horizontal stripes using some or all of the colours red, green and yellow. What is the number of different ways in which this can be done so that no two adjacent stripes have the same colour? **(2023)**

(a) 12 (b) 18
(c) 24 (d) 36

Ans: (c)

Explanation:

- Number of colours = 3 i.e., yellow, red & green
- Number of stripes to be used in flag = 4
- Required number of ways in which this flag can be made so that no two adjacent stripes have the same colour.



- Number of ways in which place 1 colour be filled is 3. Now we are left with 2 colours after filling the 1st place. So 2nd place can be filled in 2 different ways.
- For the 3rd place, we can use any of the two colours except that used in the 2nd place i.e., in 2 different ways.
- Similarly for the 4th place, we can use any of the 2 colours except that used in place 3 i.e., 2 ways.

∵ Total no of required ways is 3 × 2 × 2 × 2 = 24

- **Therefore, option (c) is the correct answer.**

50. There are five persons P, Q, R, S and T each one of whom has to be assigned one task. Neither P nor Q can be assigned Task-1. Task-2 must be assigned to either R or S. In how many ways can the assignment be done? **(2023)**

(a) 6 (b) 12
(c) 18 (d) 24

Ans: (d)

Explanation:

- There are five tasks that need to be given to five people. There are two possible situations.
- **Situation 1:** Task-2 is given to R.
- **Situation 2:** Task-2 is given to S.

Task	Situation 1	Situation 2
1.	Either S or T, choose one. There are two ways to do this.	Either R or T, choose one. There are two ways to do this.
2.	R	S
3.	3 ways to do it	3 ways to do it
4.	2 ways to do it	2 ways to do it
5.	1 way to do it	1 way to do it

- In Situation 1, total number of conceivable ways = 2 × 1 × 3 × 2 × 1 = 12 ways
- In Situation 2, total number of conceivable ways = 2 × 1 × 3 × 2 × 1 = 12 ways
- Hence, the assignment can be done in 12 + 12 = 24 ways. **Therefore, option (d) is the correct answer.**

51. There are large number of silver coins weighing 2 gm, 5 gm, 10 gm, 25 gm, 50 gm each. Consider the following statements : **(2023)**

1. To buy 78 gm of coins one must buy at least 7 coins.
2. To weigh 78 gm using these coins one can use less than 7 coins.

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

Ans: (c)

Explanation:

- The coins weigh 2 grams, 5 grams, 10 grams, 25 grams, and 50 grams.
- **Statement 1:** Let's figure out how many least coins we need to make 78 grams. We need to have as many of the heavier coins as possible. Hence, we will use:
- A coin that weighs 50 grams.
- Two coins weigh 10 grams each.

- There are four coins that weigh 2 grams each.
- So, if we want to buy 78 grams of something, we will need a minimum of 7 coins: 1 coin of 50 gram, 2 coins of 10 gram, and 4 coins of 2 gram. **Hence, it is correct.**
- **Statement 2:** To measure 78 grams, we can put an 80-gram weight on one side and a 2-gram coin on the other side.
- To have 80 grams, we require: "A coin weighs 50 gram."
- A coin weighing 25 gram.
- One small coin of weighs 5 gram.
- So, we need 4 coins to measure a weight of 78 gram – one coin that weighs 50 gram, another coin that weighs 25 gram, another coin that weighs 5 gram, and one more coin that weighs 2 gram.
- So, the second statement is correct. **Hence, it is correct. Therefore, option (c) is the correct answer.**

52. Consider the following : **(2023)**

I. A + B means A is neither smaller nor equal to B.

II. A – B means A is not greater than B.

III. A x B means A is not smaller than B.

IV. A ÷ B means A is neither greater nor equal to B.

V. A ± B means A is neither smaller nor greater than B.

Statement : P x Q, P – T, T ÷ R, R ± S

Conclusion-1 : Q ± T

Conclusion-2 : S + Q

Which one of the following is correct in respect of the above Statement and the Conclusions?

(a) Only Conclusion-1 follows from the Statement.

(b) Only Conclusion-2 follows from the Statement.

(c) Both Conclusion-1 and Conclusion-2 follow from the Statement.

(d) Neither Conclusion-1 nor Conclusion-2 follows from the Statement.

Ans: (b)

Explanation:

- I. A + B means A is neither small nor equal to B i.e., A + B means A > B
- II. A – B means A is not greater than B i.e., (A –B)
  $\Rightarrow A \leq B$
- III. A × B means A is not smaller than B i.e., (A × B)
  $\Rightarrow A \geq B$
- IV. A ÷ B means A is neither greater not equal to B i.e., (A ÷ B)
  $\Rightarrow A < B$
- V. A + B means A is neither smaller nor greater than B i.e., $(A \pm B) \Rightarrow A = B$
- **Statement:** P × Q, P – T, T ÷ R, R ± S i.e., $P \geq Q$, $P \leq T$, $T < R$, $R = S$
- **Conclusion 1 :** $Q \pm T \Rightarrow Q = T$

  $\therefore$ $P \geq Q$ & $P \leq T$ so there might be a possibility when P = Q, & P = T then Q = T

  $\therefore$ Conclusion 1 does not follow because Q = T is not true in all case.

  Conclusion 2: $S + Q \Rightarrow S > Q$

  $\therefore$ $P \geq Q$ & $P \leq T$ & $R > T$

  $\Rightarrow Q < T \Rightarrow R > Q$

  $\therefore$ $R = S \Rightarrow S > Q$
- So only Conclusion 2 follows from the statement. **Therefore, option (b) is the correct answer.**

53. Consider the sequence **(2023)**

ABC_ _ ABC_ DABBCD_ ABCD

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

(a) DACB (b) CDAB

(c) DCCA (d) DDCA

Ans: (d)

Explanation:

- The sequence is: ABC_ _ABC_DABBCD_ABCD
- We can split this sequence into five groups, with each group having four elements. In simple words, when we analyze it this way, we can see that the last thing moves to the first position in a cycle.
- The concluded sequence is: ABCD, DABC, CDAB, BCDA, ABCD
- **Therefore, option (d) is the correct answer.**

54. Consider the following statements in respect of five candidates P, Q, R, S and T. Two statements are true and one statement is false. **(2023)**

True Statement : One of P and Q was selected for the job.

False Statement : At least one of R and S was selected for the job.

True Statement : At most two of R, S and T were selected for the job.

Which of the following conclusions can be drawn?

1. At least four were selected for the job.
2. S was selected for the job.

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

Ans: (d)

Explanation:

- Given candidates are P, Q, R, S, T.
- Let's analyze the given statements and see what conclusions we can draw from them:
  1. True Statement: One of P and Q was selected for the job.
  2. False Statement : At least one of R and S was selected for the job.
  3. True Statement : At most two of R, S, and T were selected for the job.
- Let's break down each statement:
  - Statement 1 tells us that either P or Q was selected. This means that only one of them was selected.
  - Statement 2 is false, which means that at most one of R & S could be selected or minimum none could be selected This implies that candidates R and S were not selected for the job.
  - Statement 3 states that at most two out of R, S, and T were selected. This means that either zero, one, or two of R, S, and T were selected
- From the above information, we can deduce the following:
  - P or Q was selected.
  - Either R or S were selected or none of them were selected.
  - R, S, and T could be selected at most two out of these three.
- Now let's evaluate the conclusions:
  - **Conclusion-1:** At least four were selected for the job: We can conclude that from Statement 1 either P or Q is selected and From Statement 2 Either of R or S is selected or none is selected and from Statement 3 at most two of the R, S, T can be selected. Hence the total number of person selected for job is at most 4. Hence conclusion 1 is not true.
  - **Conclusion-2:** S was selected for the job: From the above Statement 2 it is not clear whether S is selected or not. So, this conclusion is not valid.
- Based on the given statements, none of the provided conclusions can be drawn. **Therefore, option (d) is correct answer.**

55. Let P, Q, R, S and T be five statements such that: **(2023)**

I. If P is true, then both Q and S are true.

II. If R and S are true, then T is false.

Which of the following can be concluded?

1. If T is true, then at least one of P and R must be false.
2. If Q is true, then P is true.

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

Ans: (a)

Explanation:

- I. If P is true, then both Q & S are true
  II. If R & S are true, then T is false.
- If T is true, then from II. We follow that both R & S cannot be true i.e., either of them or both of them are false.
- **Case I :** either of them is false (Say R is false.)
- Then conclusion 1 follows & is true.
- Suppose S is false & R is true, then from I, we get that P must not be true because if P is true, both Q & S are true.
- **Case II :** Both are false i.e., R & S are false.
- Then same logic follows for P & R to be false

  $\therefore$ 1st conclusion is correct.
- From I, we have that if P is true, both Q & S are true. i.e., Conversely one can say that if Q & S are true then only P is true. So for only Q we are not sure that P is true or not. So conclusion 2 is wrong.
- **Therefore, option (a) is the correct answer.**

56. The letters of the word "INCOMPREHENSIBILITIES" are arranged alphabetically in reverse order. How many positions of the letter/letters will remain unchanged? **(2023)**

(a) None (b) One

(c) Two (d) Three

Ans: (c)

Explanation:

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

  (Reverse in alphabetic order)
- Matching the two words we get only two repetitive characters i.e., I,I
- **Therefore, option (c) is the correct answer.**

57. What is the value of X in the sequence 20, 10, 10, 15, 30, 75, X? **(2022)**

(a) 105 (b) 120

(c) 150 (d) 225

Ans: (d)

Explanation:

- The given series is 20, 10, 10, 15, 30, 75, X. We are required to find 'X'.

- It can be observed here that numbers in the initial half of the series are decreasing, and they start increasing in the latter half. The rate of increase in the latter half of the series indicates that there is some pattern of multiplication involved in the series.
- The pattern of multiplication involved in the given series is as follows:

  $20 \times 0.5 = 10$

  $10 \times 1 = 10$

  $10 \times 1.5 = 15$

  $15 \times 2 = 30$

  $30 \times 2.5 = 75$

  $75 \times 3 = 225$
- Hence, we can see that the required number in place of 'X' is 75×3, i.e., 225. **Therefore, option (d) is the correct answer.**

58. Two friends X and Y start running and they run together for 50 m in the same direction and reach a point. X turns right and runs 60 m, while Y turns left and runs 40 m. Then X turns left and runs 50 m and stops, while Y turns right and runs 50 m and then stops. How far are the two friends from each other now? **(2022)**

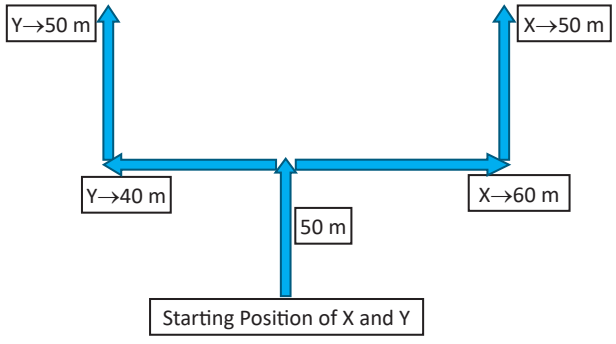
(a) 100 m (b) 90 m

(c) 60 m (d) 50 m

Ans: (a)

Explanation:

- The path taken by X and Y can be illustrated as below:



- From the figure it can be clearly observed that the final distance between X and Y is 100 m. **Therefore, option (a) is the correct answer.**

59. Which date of June 2099 among the following is Sunday? **(2022)**

(a) 4 (b) 5

(c) 6 (d) 7

Ans: (d)

Explanation:

- Let's take any recent Sunday as the reference date. For example, 5th June 2022 was a Sunday.
- Total number of years between the year 2099 and 2022 is, 2099 – 2022 = 77 years.
- Number of leap years between 2099 and 2022 = 77/4 = 19 leap years (ignoring the remainder 1). Total number of normal years between 2099 and 2022 are 58 years.
- Number of odd days = (58 × 1) + (19 × 2) = 58 + 38 = 96
- Now, 1 Week = 7 days, 96/7 = Gives 5 as a remainder. That means, June 5th 2099 = Sunday + 5 days = Friday. Hence, 7th June 2099 will be a Sunday. **Therefore, option (d) is the correct answer.**

60. If the order of the letters in the English alphabet is reversed and each letter represents the letter whose position it occupies, then which one of the following represents 'LUCKNOW'? **(2022)**

(a) OGXPMLD

(b) OGXQMLE

(c) OFXPMLE

(d) OFXPMLD

Ans: (d)

Explanation:

- **Method-I**
  - Here, we need to find the letter's position when the alphabetic series is reversed.
  - That means for every letter in the word 'Lucknow' we must replace it with a new letter as per the reversed position.

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
26	25	24	23	22	21	20	19	19	17	16	15	14

14	15	16	17	18	19	20	21	22	23	24	25	26
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
13	12	11	10	9	8	7	6	5	4	3	2	1

  - Given above is the original as well as reversed position of the letters. By observing the figure, we can easily find the reversed position for any letter. Example, letter opposite to A (original position = 1) is Z (reversed position = 1) and so on.
  - Using this method, we get our answer as: OFXPMLD
- **Method-II**
  - Opposite position of a given letter can be found by subtracting the original letter position from 27.
    - For example, opposite letter position of 'L' = 27 – 12 = 15.

- Here, the 15th letter in the alphabet represents opposite of L i.e., 'O'

- Using the same approach for all the letters in the word 'Lucknow' we get:

  L = 27 – 12 = 15 = O

  U = 27 – 21 = 6 = F

  C = 27 – 3 = 24 = X

  K = 27 – 11 = 16 = P

  N = 27 – 14 = 13 = M

  O = 27 – 15 = 12 = L

  W = 27 – 23 = 4 = D

- Using this method too we get the answer as: OFXPMLD

- So, the required answer is OFXPMLD. **Therefore, option (d) is the correct answer.**

61. In a tournament of Chess having 150 entrants, a player is eliminated whenever he loses a match. It is given that no match results in a tie/draw. How many matches are played in the entire tournament? **(2022)**

(a) 151 (b) 150

(c) 149 (d) 148

Ans: (c)

Explanation:

- As per the given question, there are total 150 players when the tournament started. Only 2 players can play in a single match, and one player is eliminated after every match.
- So, 150 players would play 150/2 i.e., 75 matches and 75 players would proceed further into the tournament while remaining 75 players will get eliminated.
- 37 matches will be held in the next round of the remaining 75 players from first round. 37 players would be eliminated at this stage while remaining 38 players would proceed further.
- In the next round for 38 players, 19 matches will be held. Thus, eliminating 19 players and retaining another 19 for the next round.
- 9 matches will be held in next round of remaining 19 players. 10 players would be retained after elimination.
- 5 matches will be held in next round of remaining 10 players and 5 players would be retained.
- 2 matches will be held in next round of remaining 5 players and 3 players would be retained.
- 2 matches will be held for 3 remaining players out of which only one will win.
- So, total matches held = 75 + 37 + 19 + 9 + 5 + 2 + 2 = 149.
- **Alternate Method:** Consider a single player winning all the matches, which would be 149 matches with remaining 149 players. **Therefore, option (c) is the correct answer.**

62. Consider the Question and two Statements given below: **(2022)**

Question: Is Z brother of X?

Statement-1: X is a brother of Y and Y is a brother of Z.

Statement-2: X, Y and Z are siblings.

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

(a) Statement-1 alone is sufficient to answer the Questions

(b) Statement-2 alone is sufficient to answer the Question

(c) Both Statement-1 and Statement-2 are sufficient to answer the Question

(d) Both Statement-1 and Statement-2 are not sufficient to answer the Question

Ans: (d)

Explanation:

- **Statement 1:** X is the brother of Y, and Y is the brother of Z. From this we can conclude that X and Y are brothers, and they both are brothers of Z i.e., X, Y and Z are siblings. However, we cannot find the gender of Z, whereas gender of X and Y, i.e., male, is known. **Thus, it is not sufficient to answer the question.**
- **Statement 2:** X, Y, Z are siblings. This information has already been deduced from statement 1. Even in this statement the gender of Z is unknown. **Thus, it is not sufficient to answer the question. Therefore, option (d) is the correct answer.**

63. Three persons A, B and C are standing in a queue not necessarily in the same order. There are 4 persons between A and B, and 7 persons between B and C. If there are 11 persons ahead of C and 13 behind A, what could be the minimum number of persons in the queue? **(2022)**

(a) 22 (b) 28

(c) 32 (d) 38

Ans: (a)

Explanation:

- There are 4 persons between A and B and 7 persons between B & C. There can be more than one possible case for such arrangement.
  - Case I: A [4] B [7] C
  - Case II: B [4] A [2] C
  - Case III: C [7] B [4] A
  - Case IV: C [2] A [4] B
- We are not going to consider 'Case-I' because there are more than 11 persons ahead of C in the first case, which

goes against the given criteria in the question. So, we are left with other 3 cases.

- Case II: 3 B 4 A 2 C 10
- Total number of people in this case is 22
- In same way, total number of people in Case-III are 38 and Case-IV are 28.
- The minimum number of required persons in the queue are 22. **Therefore, option (a) is the correct answer.**

64. P, Q, R, S, T and U are six members of a family. R is the spouse of Q, U is the mother of T and S is the daughter of U. P's daughter is T and R's son is P. There are two couples in the family. Which one of the following is correct? **(2022)**

(a) Q is the grandfather of T

(b) Q is the grandmother of T

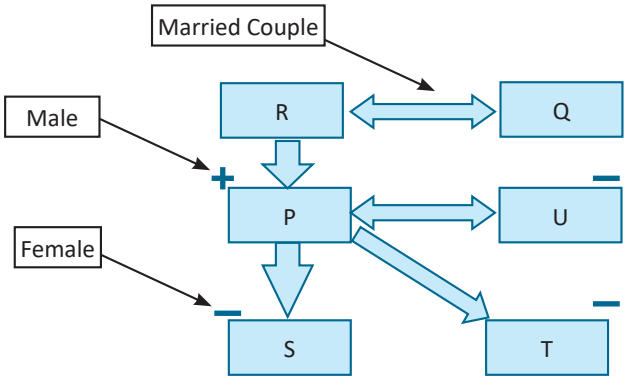
(c) R is the mother of P

(d) T is the granddaughter of Q

Ans: (d)

Explanation:

- As per the information given in the question, we can arrive at the following family diagram:



- From the family tree, it is clear that 'T' is the granddaughter of Q. **Therefore, option (d) is the correct answer.**

65. Two Statements followed by four Conclusions are given below. You have to take the Statements to be true even if they seem to be at variance from the commonly known facts. Read all the Conclusions and then decide which of the given Conclusions logically follows follow from the Statements, disregarding the commonly known facts: **(2022)**

Statement-1: All pens are books.

Statement-2: No chair is a pen.

Conclusion-I: All chairs are books.

Conclusion-II: Some chairs are pens.

Conclusion-III: All books are chairs.

Conclusion-IV: No chair is a book.

Which one of the following is correct?

(a) Only Conclusion-I

(b) Only Conclusion-II

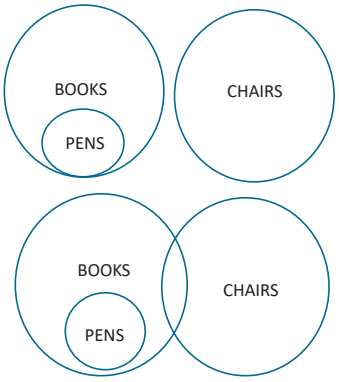
(c) Both Conclusion-III and Conclusion-IV

(d) None of the Conclusion follows

Ans: (d)

Explanation:

- From the given statements we can draw the following Venn diagrams:



- Hence, it can be observed that none of the given conclusions follows. **Therefore, option (d) is the correct answer.**

66. Three Statements followed by three Conclusions are given below. You have to take the Statements to be true even if they seem to be at variance from the commonly known facts. Read all the Conclusions and then decide which of the given Conclusions logically follows/follow from the Statements, disregarding the commonly known facts: **(2022)**

Statement-1: Some doctors are teachers.

Statement-2: All teachers are engineers.

Statement-3: All engineers are scientists.

Conclusion-I: Some scientists are doctors.

Conclusion-II: All engineers are doctors.

Conclusion-III: Some engineers are doctors.

Which one of the following is correct?

(a) Only Conclusion-I

(b) Only Conclusion-II

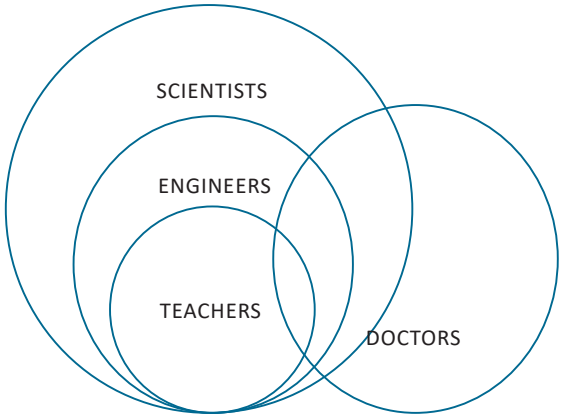
(c) Both Conclusion-I and Conclusion-III

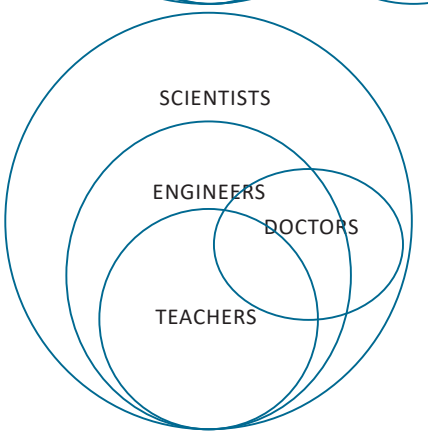
(d) Both Conclusion-I and Conclusion-II

Ans: (c)

Explanation:

- From the given statements we can draw the following Venn diagrams:





- Hence, it can be observed that only Conclusion-I and Conclusion-III follows. **Therefore, option (c) is the correct answer.**

67. Eight students A, B, C, D, E, F, G and H sit around a circular table, equidistant from each other, facing the centre of the table, not necessarily in the same order. B and D sit neither adjacent to C nor opposite to C. A sits in between E and D, and F sits in between B and H. Which one of the following is definitely correct? **(2022)**

(a) B sits in between A and G

(b) C sits opposite to G

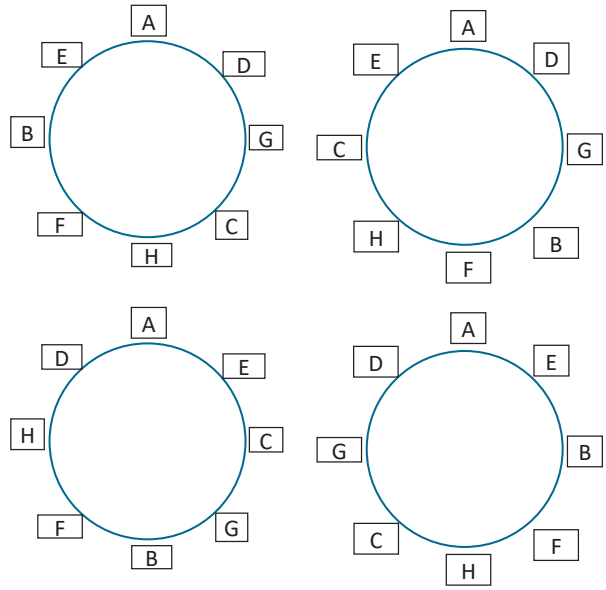
(c) E sits opposite to F

(d) None of the above

Ans: (d)

Explanation:

- According to the information given in the question we can arrive at a number of seating arrangements as below:



- We can see that there are numerous arrangements possible with the given information and that none of the conclusion is definitely correct. **Therefore, option (d) is the correct answer.**

68. A man started from home at 14:30 hours and drove to village, arriving there when the village clock indicated 15:15 hours. After staying for 25 minutes, he drove back by a different route of length 1.25 times the first route at a rate twice as fast reaching home at 16:00 hours. As compared to the clock at home, the village clock is **(2022)**

(a) 10 minutes slow (b) 5 minutes slow

(c) 10 minutes fast (d) 5 minutes fast

Ans: (d)

Explanation:

- According to the given information, the man left his home at 14:30 hours and reached back home at 16:00 hours, i.e., he travelled for a total period of 1.5 hours i.e., for 90 minutes
- Out of this time, he stayed in the village for 25 minutes. Therefore, his total travelling time is 65 minutes.
- While returning the route was 1.25 times the length of the initial route. So, time taken must have increased by 25% too.
- Assuming the initial time as 100 units, while returning it must be 125 units. But it is given that while returning, his driving speed was double. So, time taken must have been halved.
- Thus, the time taken when returning home is 125/2 i.e., 62.5 units. So, 100 + 62.5 = 65 minutes or 162.5 units = 65 minutes.

- So, 100 units = (65/162.5) × 100 = 40 minutes. So, the man took 40 minutes to reach to the village. So, the actual time at that moment = 14:30 + 40 minutes = 15:10 hours.
- It's pretty evident that the village clock is 15:15 – 15:10 = 5 minutes faster. **Therefore, option (d) is the correct answer.**

69. Six Persons A, B, C, D, E and F are sitting equidistant form each other around a circular table (facing the centre of the table). **(2022)**

Consider the Question and two statements given below:

Question: Who is sitting on the immediate left of A?

Statement-1: B is sitting opposite to C and D is sitting opposite to E.

Statement-2: F is sitting on the immediate left of B.

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

(a) Statement-1 alone is sufficient to answer the question

(b) Statement-2 alone is sufficient to answer the question

(c) Both Statement-1 and Statement-2 are sufficient to answer the Question

(d) Both Statement-1 and Statement-2 are not sufficient to answer the Question

Ans: (d)

Explanation:

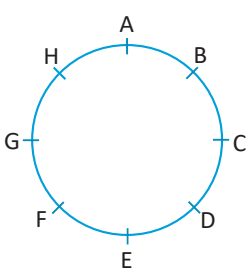
- It's pretty evident that neither of the two statements is sufficient alone. Even on combining the two, we get two possible cases:
  - Case I: when D is sitting on immediate left of A
  - Case II: when E is sitting on the immediate left of A
- On observing the above two cases, we can say that the person who is sitting to the immediate left of A cannot be determined. **Therefore, option (d) is the correct answer.**

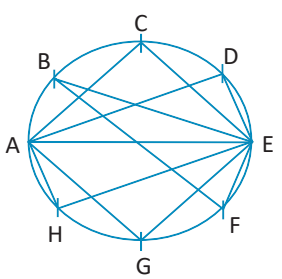
70. There are eight equidistant points on a circle. How many right-angled triangles can be drawn using these points as vertices and taking the diameter as one side of the triangle? **(2022)**

(a) 24 (b) 16

(c) 12 (d) 8

Ans: (a)





Explanation:

- Consider these eight equidistant points on the circle, which are named as A, B, C, D, E, F and G.
- First let's consider base AE i.e., the diameter, to draw the right-angled triangle. We can observe that there are six right angled triangle formed when base AE is considered.
- Similarly, other bases BF, CG, DH as diameter also make right-angled triangle.
- Therefore, total number of right-angled triangles will be = 6 + 6 + 6 + 6 = 24. **Therefore, option (a) is the correct answer.**

71. What is the value of X in the sequence 2, 12, 36, 80, 150, X? **(2022)**

(a) 248 (b) 252

(c) 258 (d) 262

Ans: (b)

Explanation:

- The given sequence is: 2, 12, 36, 80, 150, X. We have to find X in this sequence.
- Consider the difference between the given terms,

  1^{st} and 2^{nd} = 12 – 2 = 10

  2^{nd} and 3^{rd} = 36 – 12 = 24

  3^{rd} and 4^{th} = 80 – 36 = 44

  4^{th} and 5^{th} = 150 – 80 = 70
- Consider the 2^{nd} difference i.e., difference between the differences of original sequence,

  1^{st} and 2^{nd} = 24 – 10 = 14

  2^{nd} and 3^{rd} = 44 – 24 = 20

  3^{rd} and 4^{th} = 70 – 44 = 26
- Therefore, 2^{nd} difference terms have a common difference of 6 (i.e., 20 – 14 = 6 and 26 – 20 = 6)
- Therefore, 5^{th} term of 2^{nd} difference will be = 26 + 6 = 32.
- Therefore, 6^{th} term of the first difference will be = 70 + 32 = 102
- Therefore, X = 150 + 102 = 252. **Therefore, option (b) is the correct answer.**

72. A Statement followed by Conclusion-I and Conclusion-II is given below. You have to take the Statement to be true even if it seems to be at variance from the commonly known facts. Read all Conclusions and then decide which of the given Conclusion(s) logically follows/follow from the Statement, disregarding the commonly known facts **(2021)**

Statement: Some radios are mobiles. All mobiles are computers. Some computers are watches.

Conclusion-I: Certainly some radios are watches.

Conclusion-II: Certainly some mobiles are watches.

Which one of the following is correct?

(a) Only Conclusion-I

(b) Only Conclusion-II

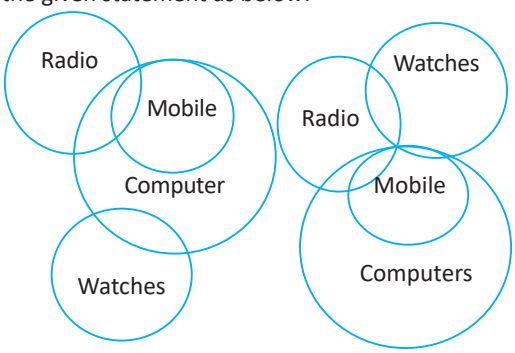
(c) Both Conclusion-I and Conclusion-II

(d) Neither Conclusion-I nor Conclusion-II

Ans: (d)

Explanation

- As per the given data, we can consider the multiple cases for the given statement as below:



- As per the above diagrams of different cases, we can conclude that Conclusion I and Conclusion II doesn't follow (because of the word 'certainly'). **Therefore, option (d) is the correct answer.**

73. A woman runs 12 km towards her North, then 6 km towards her South and then 8 km towards her East. In which direction is she from her starting point? **(2021)**

(a) An angle less than 45° South of East

(b) An angle less than 45° North of East

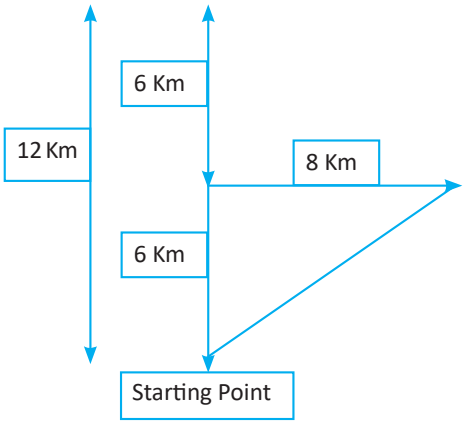
(c) An angle more than 45° South of East

(d) An angle more than 45° North of East

Ans: (b)

Explanation:

- Path followed by the woman is shown below in the figure:



- It is a known property of geometry that the angle opposite to the larger side is always greater. As we can see clearly from the figure, the woman will be "at an angle less than 45° North of East" (angle between the line connecting starting point and the end point and the horizontal). **Therefore, option (b) is the correct answer.**

74. Replace the incorrect term by the correct term in the given sequence

3, 2, 7, 4, 13, 10, 21, 18, 31, 28, 43, 40

where odd terms and even terms follow the same pattern. **(2021)**

(a) 0 (b) 1

(c) 3 (d) 6

Ans: (a)

Explanation:

- On separating the Odd and the Even Series, we observe the following pattern:

Odd Series	Even Series
3	2
7 = 3 + 4	4 = 0 + 4
13 = 7 + 6	10 = 4 + 6
21 = 13 + 8	18 = 10 + 8
31 = 21 + 10	28 = 18 + 10
43 = 31 + 12	40 = 28 + 12

- As we can see clearly in the above table, when comparing and observing the given series, it can be concluded that the first term in even series should be 0 and not 2. **Therefore, option (a) is the correct answer.**

75. Seven books P, Q, R, S, T, U and V are placed side by side. R, Q and T have blue covers and other books have red covers. Only S and U are new books and the rest are old. P, R and S are law reports; the rest are Gazetteers. Books of old Gazetteers with blue covers are **(2021)**

(a) Q and R (b) Q and U

(c) Q and T (d) T and U

Ans: (c)

Explanation:

	P	Q	R	S	T	U	V
Colors	Red	Blue	Blue	Red	Blue	Red	Red
Old/New	Old	Old	Old	New	Old	New	Old
Law/ Gazetteers	Law	Gazetteers	Law	Law	Gazetteers	Gazetteers	Gazetteers

- As we can see clearly in the above table, Q & T are the old gazetteers with blue covers. **Therefore, option (c) is the correct answer.**

76. Following is a matrix of certain entries. The entries follow a certain trend row-wise. Choose the missing entry (?) accordingly. **(2021)**

7B	10A	3C
3C	9B	6A
10A	13C	?

(a) 9B (b) 3A
(c) 3B (d) 3C

Ans: (c)

Explanation:

- As per the given data in the question, we can conclude that rows follow a sequence.

7B	10A	3C
3C	9B	6A
10A	13C	?

- As we can see clearly in the above table,
  First Row: 10 – 7 = 3
  Second Row: 9 – 3 = 6
  Therefore, in third row: 13 – 10 = 3
- Now for the alphabets, sequence is
  For the first row: BAC
  Second Row: CBA
  Therefore, for the third row it's: ACB
- So, the missing item is 3B. **Therefore, option (c) is the correct answer.**

77. You are given two identical sequences in two rows: **(2021)**

Sequence-I:	8	4	6	15	52.5	236.5
Sequence-II:	5	A	B	C	D	E

What is the entry in the place of C for the Sequence-II?

(a) 2.5 (b) 5
(c) 9.375 (d) 32.8125

Ans: (c)

Explanation:

- As per the given data in the question, the pattern being followed in the two sequences is given below:

Sequence-I	Sequence-II
8 × 0.5 = 4	5 × 0.5 = 2.5 (value of A)
4 × 1.5 = 6	2.5 × 1.5 = 3.75 (value of B)
6 × 2.5 = 15	3.75 × 2.5 = 9.375 (Value of C)
15 × 3.5 = 52.5	
52.5 × 4.5 = 236.5	

- As we can see clearly in the above table, the value of C is 9.375. **Therefore, option (c) is the correct answer.**

78. A person X from a place A and another person Y from a place B set out at the same time to walk towards each other. The places are separated by a distance of 15 km. X walks with a uniform speed of 1.5 km/hr and Y walks with a uniform speed of 1 km/hr in the first hour, with a uniform speed of 1.25 km/hr in the second hour and with a uniform speed of 1.5 km/hr in the third hour and so on.

Which of the following is/are correct? **(2021)**

1. They take 5 hours to meet.
2. They meet midway between A and B.

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

Ans: (c)

Explanation:

- As per the data given in the question,
  Distance b/w A & B = 15 km
  Travelling Speed of 'X' = 1.5 km/h (constant)
  Therefore, distance travelled by 'X' in 5 hours = 1.5 × 5 = 7.5 km
- Speed of 'Y' in 1st hour = 1 km/h
- Therefore, distance travelled by 'Y' in 1st hour = 1 × 1 = 1 km
- Similarly, distance travelled by 'Y' in 2nd hour = 1.25 × 1 = 1.25 km
- Similarly, distance travelled by 'Y' in 3rd hour = 1.5 × 1 = 1.5 km
- Similarly, distance travelled by 'Y' in 4th hour = 1.75 × 1 = 1.75 km
- Similarly, distance travelled by 'Y' in 5th hour = 2 × 1 = 2 km
- Therefore, the total distance travelled by 'Y' in 5 hours = 1 + 1.25 + 1.5 + 1.75 + 2 = 7.5 km. **Hence, both the given statements are correct. Therefore, option (c) is the correct answer.**

79. In a group of 120 persons, 80 are Indians and rest are foreigners. Further, 70 persons in the group can speak English. The number of Indians who can speak English is **(2021)**

(a) 20 (b) 30
(c) 30 or less (d) 30 or more

Ans: (d)

Explanation:

- As per the given data, 80 persons are Indians out of 120 persons. It means that the remaining 40 persons are foreigners.

- Of the total 120 persons, 70 persons in the group can speak English. That means 50 persons of the group cannot speak English.
- If all the English-speaking people are Indians, then, the maximum possible number of Indians who can speak English is 70.
- Also, the minimum possible number of Indians who can speak English is 30 (when all the 40 foreigners can speak English).
- Therefore, Indians who can speak English will be in the range of 30 to 70 (or more than 30). **Therefore, option (d) is the correct answer.**

80. Consider all 3-digit numbers (without repetition of digits) obtained using three non-zero digits which are multiples of 3. Let S be their sum. **(2021)**

Which of the following is/are correct?

1. S is always divisible by 74.
2. S is always divisible by 9.

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

Ans: (c)

Explanation:

- As per the given data, three non-zero digits which are multiples of 3 are: 3, 6, and 9.
- Using these 3 digits, we can make 6 three-digit numbers.
- Therefore, their sum, S = 369 + 396 + 639 + 693 + 936 + 963 = 3996
- Hence, it can be concluded that S is divisible by both 74 and 9. **Therefore, option (c) is the correct answer.**

81. There are two Classes A and B having 25 and 30 students respectively. In Class-A the highest score is 21 and lowest score is 17. In Class-B the highest score is 30 and lowest score is 22. Four students are shifted from Class-A to Class-B. **(2021)**

Consider the following statements:

1. The average score of Class-B will definitely decrease.
2. The average score of Class-A will definitely increase.

Which of the above statements is/are correct?

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

Ans: (a)

Explanation:

- An average is the median of all the values which are being considered.
- It is given that the range of score for Class-A is 17 to 21 and that for Class-B it is 22 to 30.
- From this information, we can infer that the average score of Class-A lies between 17 and 21, and for Class-B it lies between 22 and 30.
- This means that, average of Class-B > average of Class-A
- Further, it can be observed that the highest score of Class-A i.e., 21, is lower than the lowest score of Class-B i.e., 22.
- Now, from the above established statements we can say that on shifting four students from Class-A to Class-B, the average of Class-B will definitely decrease. As the highest score which can be added to Class-B cannot be more than 21, this will only decrease the average of Class-B.
- Similarly, from the given information, nothing can be said about the resultant average of Class-A. As here we do not know the scores of the four students who are being shifted to Class-B. **Therefore, option (a) is the correct answer.**

82. Consider two Statements and a Question: **(2021)**

Statement-1: Priya is 4 ranks below Seema and is 31st from the bottom.

Statement-2: Ena is 2 ranks above Seema and is 37th from the bottom.

Question: What is Seema's rank from the top in the class of 40 students?

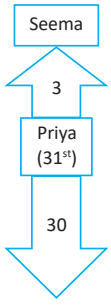
Which one of the following is correct in respect of the Statements and the Question?

(a) Statement-1 alone is not sufficient to answer the Question
(b) Statement-2 alone is not sufficient to answer the Question
(c) Either Statement-1 alone or Statement-2 alone is sufficient to answer the Question
(d) Both Statement-1 and Statement-2 are required to answer the Question

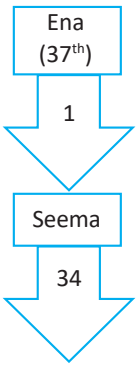
Ans: (c)

Explanation:

- **Statement-1:** It can be illustrated as:



- **Statement-2:** It can be illustrated as:



- Now, as per the question, we know that there are 40 students in the class, and we are required to find Seema's rank using information given in either Statement-1 or Statement-2; or both.
- We can observe that Seema's rank can be found using either of the statements independently. **Therefore, option (c) is the correct answer.**

83. Consider two Statements and a Question: **(2021)**

Statement-1: Each of A and D is heavier than each of B, E and F, but none of them is the heaviest.

Statement-2: A is heavier than D, but is lighter than C.

Question: Who is the heaviest among A, B, C, D and E?

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

(a) Statement-1 alone is sufficient to answer the Question

(b) Statement-2 alone is sufficient to answer the Question

(c) Both Statement-1 and Statement-2 are required to answer the Question

(d) Neither Statement-1 alone nor Statement-2 alone is sufficient to answer the Question

Ans: (c/d)

Explanation:

- **Statement 1:** A & D > B, E and F. As none of them is the heaviest and no information about C is available, so, statement-1 alone is not sufficient.
- **Statement 2:** C > A > D.
- Hence, only on using the information given in both statements 1 and 2 we can determine that C is the heaviest. **Therefore, option (c) and option (d) are the correct answers.**

84. In the English alphabet, the first 4 letters are written in opposite order, and the next 4 letters are written in opposite order and so on; and at the end Y and Z are interchanged. Which will be the fourth letter to the right of the 13th letter? **(2021)**

(a) N (b) T

(c) H (d) I

Ans: (b)

Explanation:

- The letters in the English alphabet are: ABCD EFGH IJKL MNOP QRST UVWX YZ
- As per the given question, the above set of letters should be written in opposite order, and it will look like the following sequence: DCBA HGFE LKJI PONM TSRQ XWVU ZY
- Therefore, the 13th letter of the above sequence is P. Hence, the 4th letter to the right of P is T. **Therefore, option (b) is the correct answer.**

85. Half of the villagers of a certain village have their own houses. One-fifth of the villagers cultivate paddy. One-third of the villagers are literate. Four-fifth of the villagers are under 25 years of age. Which one of the following statements is certainly correct? **(2021)**

(a) All the villagers who have their own houses are literate.

(b) Some villagers under 25 years of age are literate.

(c) Only half of the villagers who cultivate paddy are literate.

(d) No villager under 25 years of age has his own house.

Ans: (b)

Explanation:

- 50% of the villagers have their own house.
- 20% of the villagers cultivate paddy.
- 33.33% of the villagers are literate.
- 80% of the villagers are under 25 years of age.
- Since 80% of the villagers are under 25 years of age, and 33.33% of the villagers are literate. Therefore, at least some of the villagers under 25 years of age must be literate. **Therefore, option (b) is the correct answer.**

86. Consider two Statements and a Question:

Statement-1: The last day of the month is a Wednesday.

Statement-2: The third Saturday of the month was the seventeenth day.

Question: What day is the fourteenth of the given month?

Which one of the following is correct in respect of the Statements and the Question? **(2021)**

(a) Statement-1 alone is sufficient to the answer of the Question

(b) Statement-2 alone is sufficient to answer the Question

(c) Both Statement-1 and Statement-2 are required to answer the Question

(d) Neither Statement-1 alone nor Statement-2 alone is sufficient to answer the Question

Ans: (b)

Explanation:

- As per the information given, let's analyze both the statements.
- **Statement 1:** It is given that the last day of the month is a Wednesday. But the number of days in this particular month is not known. Therefore, we cannot find the 14^{th} day of that month. **Hence, statement 1 alone is not sufficient to answer the question.**
- **Statement 2:** 17^{th} of that month is the third Saturday. Therefore, the 14^{th} of that month must be a Wednesday. **Hence, statement 2 alone is sufficient to answer the question. Therefore, option (b) is the correct answer.**

87. Consider two Statements and four Conclusions given below. You have to take the Statements to be true even if they seem to be at variance from the commonly known facts. Read all Conclusions and then decide which of the given Conclusion(s) logically follows/follow from the Statements, disregarding the commonly known facts. **(2021)**

Statement-1: Some greens are blues.

Statement-2: Some blues are blacks.

Conclusion-1: Some greens are blacks.

Conclusion-2: No green is black.

Conclusion-3: All greens are blacks.

Conclusion-4: All blacks are greens.

Which one of the following is correct?

(a) Conclusion-1 and Conclusion-2 only

(b) Conclusion-2 and Conclusion-3 only

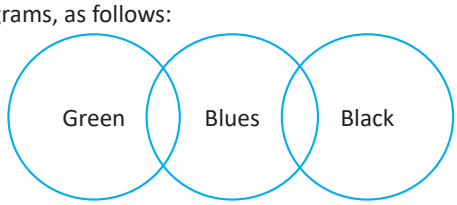
(c) Conclusion-3 and Conclusion-4 only

(d) Neither Conclusion 1 nor 2 nor 3 nor 4

Ans: (d)

Explanation:

- The statements can be represented in the form of Venn diagrams, as follows:



- **Conclusion 1:** Some greens are blacks – Not mandatory. **Hence, it is not correct.**
- **Conclusion 2:** No green is black – Not mandatory. **Hence, it is not correct.**
- **Conclusion 3:** All greens are black – Not mandatory. **Hence, it is not correct.**
- **Conclusion 4:** All blacks are greens – Not mandatory. **Hence, it is not correct.**
- Thus, none of the conclusions are correct. **Therefore, option (d) is the correct answer.**

88. What is the value of 'X' in the sequence 2, 7, 22, 67, 202, X, 1822? **(2021)**

(a) 603 (b) 605

(c) 607 (d) 608

Ans: (c)

Explanation:

- As per the given question, the given sequence is 2, 7, 22, 67, 202, X, 1822
- The pattern being followed here is given below (triple +1): $2 \times 3 + 1 = 7$, $7 \times 3 + 1 = 22$, $22 \times 3 + 1 = 67$, $67 \times 3 + 1 = 202$, $202 \times 3 + 1 = 607$, $607 \times 3 + 1 = 1822$. **Therefore, option (c) is the correct answer.**

89. Jay and Vijay spent an equal amount of money to buy some pens and special pencils of the same quality from the same store. If Jay bought 3 pens and 5 pencils, and Vijay bought 2 pens and 7 pencils, then which one of the following is correct? **(2021)**

(a) A pencil costs more than a pen.

(b) The price of a pencil is equal to that of a pen

(c) The price of a pen is two times the price of a pencil

(d) The price of a pen is three times the price of a pencil

Ans: (c)

Explanation:

- Let's assume that the price of a pen is ₹'X' and a pencil is ₹'Y' respectively.
- As per the given data in the question: $3X + 5Y = 2X + 7Y \Rightarrow X = 2Y$
- Thus, the price of a pen is twice as that of a pencil. **Therefore, option (c) is the correct answer.**

90. In a code language 'MATHEMATICS' is written as 'LBSIDNZUHDR.' How is CHEMISTRY' written in that code language? **(2021)**

(a) DIDLHRSSX (b) BIDNHTSSX

(c) BIDLHTSSX (d) DGFLIRUQZ

Ans: (b)

Explanation:

- As per the given data, in a code language 'MATHEMATICS' is written as 'LBSIDNZUHDR.'
- The pattern used in the above coding is as follows:

  M (13) → L (12) i.e., reduction of 1

  A (1) → B (2) i.e., increase of 1

  T (20) → S (19) i.e., reduction of 1

  H (8) → I (9) i.e., increase of 1

  E (5) → D (4) i.e., decrease of 1

  M (13) → N (14), i.e., increase of 1

  A (1) → Z (26) i.e., decrease of 1

  T (20) → U (21) i.e., increase of 1

  I (9) → H (8) i.e., decrease of 1

  C (3) → D (4) i.e., increase of 1

  S (19) → R (18) i.e., decrease of 1
- Same pattern will be followed by the given word, CHEMISTRY,

  C (3) → B (2) i.e., decrease of 1

  H (8) → I (9) i.e., increase of 1

  E (5) → D (4) i.e., decrease of 1

  M (13) → N (14) i.e., increase of 1

  I (9) → H (8) i.e., decrease of 1

  S (19) → T (20) i.e., increase of 1

  T (20) → S (19) i.e., decrease of 1

  R (18) → S (19) i.e., increase of 1

  Y (25) → X (24) i.e., decrease of 1
- So, the code of CHEMISTRY will be: BIDNHTSSX. **Therefore, option (b) is the correct answer.**

91. There are three points P, Q and R on a straight line such that PQ:QR = 3:5. If n is the number of possible values of PQ:PR, then what is n equal to? **(2021)**

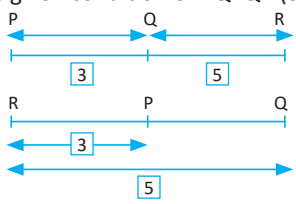
(a) 1 (b) 2

(c) 3 (d) 4

Ans: (b)

Explanation:

- As per the given question, there are three points P, Q, and R on a straight line, such that: PQ: QR = 3: 5
- Three points can be arranged in 3! i.e., 6 ways. However, the number of possible values of PQ: PR will be only 2, i.e., n = 2. These are only two because other arrangements do not satisfy the given condition of PQ: QR (3:5).



- **Therefore, option (b) is the correct answer.**

92. On a chess board, in how many different ways can 6 consecutive squares be chosen on the diagonals along a straight path? **(2021)**

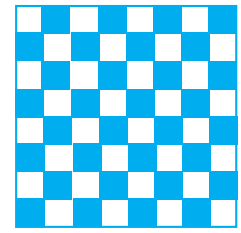
(a) 4 (b) 6

(c) 8 (d) 12

Ans: (b)

Explanation:

- Let's consider the chess board. It is 8 blocks × 8 blocks like below.



- Consider its diagonal, it has 2 diagonals. Therefore, along both the diagonals the consecutive squares have to be selected. Now, along one diagonal, 6 consecutive squares can be selected in 3 ways (1st to 6th square, 2nd to 7th square and 3rd to 8th square).
- Therefore, along both the diagonals, it can be selected in: 3 + 3 = 6 ways. **Therefore, option (b) is the correct answer.**

93. In the series_b_a_ba_b_abab_aab; fill in the six blanks (_) using one of the following given four choices such that the series follows a specific order. **(2021)**

(a) bababa (b) baabba

(c) bbaabb (d) ababab

Ans: (d)

Explanation:

- As per the given question, the given series is: _b_a_ba_b_abab_aab
- By hit and trial method, we can conclude that the pattern being followed in the above series is: abb followed by aab and so on.
- The blanks have been highlighted below: **a** b **b/**a **a** b/a **b** b/**a** ab/ab **b/**aab. **Therefore, option (d) is the correct answer.**

94. Using 2, 2, 3, 3, 3 as digits, how many distinct numbers greater than 30000 can be formed? **(2021)**

(a) 3 (b) 6

(c) 9 (d) 12

Ans: (b)

Explanation:

- As per the given question, the number is greater than 30000, so, it must start with digit 3. Also, only 5 digits are given to us, so, we must use them all: 3 _ _ _ _
  There are 4 blanks, which have to be filled by 2's and 3's.
  Number of ways to do so = 4!/(2! 2!) = 6 ways
- Therefore, the numbers formed are: 33322, 33232, 33223, 32332, 32323, and 32233. **Therefore, option (b) is the correct answer.**

95. There are 6 persons arranged in a row. Another person has to shake hands with 3 of them so that he should not shake hands with two consecutive persons. In how many distinct possible combinations can the handshakes take place? **(2021)**

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

Ans: (b)

Explanation:

- We can assume 6 persons as A, B, C, D, E, F.
- Let's arrange these people for handshake, so that they are not consecutive.
  A, C, E
  A, C, F
  B, D, F
  A, D, F
- Therefore, there are 4 ways for such an arrangement of handshake. **Therefore, option (b) is the correct answer.**

96. An amount of money was distributed among A, B and C in the ratio p: q: r. Consider the following statements: **(2021)**

1. A gets the maximum share if p is greater than (q + r).
2. C gets the minimum share if r is less than (p + q).

Which of the above statements is/are correct?

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

Ans: (a)

Explanation:

- As per the given data, ratio of distribution of money among A, B and C is p: q: r.
- **Statement 1:** Given that, p > (q + r). Therefore, p is surely the largest. Therefore, A gets the maximum share. **Hence, it is correct.**
- **Statement 2:** Given that, r < (p + q). Then, r may or may not be the smallest {ex. 7 < (3 + 5)}. Therefore, there is no clarity about the share of 'C', if its minimum or not. **Hence, it is not correct. Therefore, option (a) is the correct answer.**

97. Consider the following arrangement that has some missing letters: **(2020)**

abab_b_bcb_dcdcded_d

The missing letters which complete the arrangement are

(a) a, b, c, d (b) a, b, d, e
(c) a, c, c, e (d) b, c, d, e

Ans: (c)

Explanation:

- To complete the arrangement, we have to find a certain pattern in the given arrangement. To find the correct answer, we will place the given options in the arrangement.
- **Option (a):** ababa bbbcb cdcdc deddd – No pattern can be seen here. **Hence, it is not correct.**
- **Option (b):** ababa bbbcb ddcdc deded – No pattern can be seen here. **Hence, it is not correct.**
- **Option (c):** ababa bcbcb cdcdc deded – Repeating pattern can be seen here, i.e., ab, cb, cd, and ed. **Hence, it is correct.**
- **Option (d):** ababb bcbcb ddcdc deded – No pattern can be seen here. **Hence, it is not correct. Therefore, option (c) is the correct answer.**

98. Let A3BC and DE2F be four-digit numbers where each letter represents a different digit greater than 3. If the sum of the numbers is 15902, then what is the difference between the values of A and D? **(2020)**

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

Ans: (c)

Explanation:

- As per the information given in the question, each letter represents different digits greater than 3.

	A	3	B	C
+	D	E	2	F
1	5	9	0	2

- Here, (C + F) is ending with 2. So, let us assume the value of 'C' and consider two values: 8 or 7. If 'C' is 8 then 'F' is 4 and if 'C' is 7 then 'F' is 5. In any case, [B + 2 + 1 (carry)] is ending with 0.
  B = 7
- It means 'C' cannot be equal to 7, hence:
  C = 8 and F = 4
- Now [E + 3 + 1 (carry)] is ending with 9, so, E = 5. Hence, there is no carry forward in the next term, i.e., A + D = 15 and remaining digits are 9 and 6. Thus, 9 + 6 or 6 + 9 = 15.
  A = 9 and D = 6 or A = 6 and D = 9
- So, the difference between 'A' and 'D' is 3. **Therefore, option (c) is the correct answer.**

99. Two Statements S1 and S2 are given below followed by a Question: **(2020)**

S1: There are not more than two figures on any page of a 51-page book.

S2: There is at least one figure on every page.

Question:

Are there more than 100 figures in that book?

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

(a) Both S1 and S2 are sufficient to answer the Question, but neither S1 alone nor S2 alone is sufficient to answer the Question.

(b) S1 alone is sufficient to answer the Question.

(c) S1 and S2 together are not sufficient to answer the Question.

(d) S2 alone is sufficient to answer the Question.

Ans: (c)

Explanation:

- **Using S1 alone:** The number of figures on any page could be 0, 1 or 2. So, minimum 0 (if no figure is there on a page) and maximum 102 figures (if every page will have 2 figures) are possible. Thus, S1 alone is not sufficient to answer the question.
- **Using S2 alone:** The number of figures on a page can be: 1, 2, 3, 4, 5, ... (since, at least 1 figure on every page). Thus, S2 alone is not sufficient to answer the question.
- **Both S1 and S2:** After considering both statements, S1 and S2, together, we will have either 1 or 2 figures on a page. It gives us minimum of 51 figures (if 1 figure on every page) and maximum 102 figures (if 2 figures on every page). Hence, the given question cannot be answered even after considering both the statements, S1 and S2, together. **Therefore, option (c) is the correct answer.**

100. Consider the following data: **(2020)**

	Average marks in English	Average marks in Hindi
Girls	9	8
Boys	8	7
Overall average marks	8.8	x

What is the value of x in the above table?

(a) 7.8 (b) 7.6

(c) 7.4 (d) 7.2

Ans: (a)

Explanation:

- Let us assume that the number of boys is 'B' and number of girls is 'G.'
- So, as per the given condition in the question, we have:

$$9G + 8B = 8.8 (B + G)$$

$$9G - 8.8 G = 8.8B - 8B$$

$$0.2G = 0.8B$$

$$G = 4B$$

- That gives us ratio B : G = 1 : 4. It means that if the number of boys is 'B,' number of girls will be '4B' (where 'B' is any positive integer).
- Again, by the condition given in question:

$$8 \times 4B + 7 \times B = x (4B + B)$$

$$32B + 7B = 5B \times x$$

$$39B = 5Bx$$

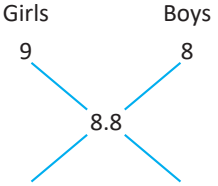
$$39 = 5x$$

$$x = (39/5) \Rightarrow x = 7.8.$$

- **Therefore, option (a) is the correct answer.**

Alternate Method:

- By alligation method:



- So, ratio of girls and boys: 0.8 : 0.2 = 4 : 1
- So, x = [(4 × 8) + (1 × 7)]/(4 + 1) = 39/5 = 7.8. **Therefore, option (a) is the correct answer.**

101. A family of two generations consisting of six members P, Q, R, S, T and U has three males and three females. There are two married couples and two unmarried siblings. U is P's daughter and Q is R's mother-in-law. T is an unmarried male and S is a male. Which one of the following is correct? **(2020)**

(a) R is U's husband.

(b) R is S's wife.

(c) S is unmarried.

(d) Nonc of the above

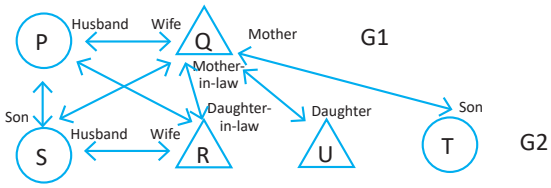
Ans: (b)

Explanation:

- Given:
  - Two generations
  - Out of six members P, Q, R, S, T and U, family has three males, three females, two married couples and two unmarried siblings.
- Logical Conclusions:
  - Out of two unmarried siblings one is male, and one is female.

- There are only two generations. Let the older generation be G1 (first generation) and younger generation be G2 (second generation).
- P and Q will be part of G1 because of being a parent and mother-in-law.
- S, U, R and T will be part of G2.

- Considering all the information, we can get following family tree (circle representing male and triangle representing female):



- As we can see from the above family tree, R is S's wife. **Therefore, option (b) is the correct answer.**

102. Two Statements S1 and S2 are given below with regard to four numbers P, Q, R and S followed by a Question: **(2020)**

S1: R is greater than P as well as Q.

S2: S is not the largest one.

Question:

Among four numbers P, Q, R and S, which one is the largest?

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

(a) S1 alone is sufficient to answer the Question.

(b) S2 alone is sufficient to answer the Question.

(c) S1 and S2 together are sufficient to answer the Question, but neither S1 alone nor S2 alone is sufficient to answer the Question.

(d) S1 and S2 together are not sufficient to answer the Question.

Ans: (c)

Explanation:

- **Using S1 alone:** S1 alone is not sufficient to answer the question because it only mentions about numbers P, Q, and R, but does not talk about the number 'S.'
- **Using S2 alone:** S2 alone is not sufficient to answer the question because according to S2, S is not the largest number, but does not give any other information about R, P and Q.
- **Both S1 and S2:** By combining S1 and S2 we get – largest number among P, Q, R, and S is 'R' because 'R' is greater than P and Q, and S is not the largest. **Therefore, option (c) is the correct answer.**

103. Two Statements S1 and S2 are given below followed by a Question: **(2020)**

S1: n is a prime number

S2: n leaves a remainder of 1 when divided by 4.

Question:

If n is a unique natural number between 10 and 20, then what is n?

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

(a) S1 alone is sufficient to answer the Question.

(b) S2 alone is sufficient to answer the Question.

(c) S1 and S2 together are sufficient to answer the Question, but neither S1 alone nor S2 alone is sufficient to answer the Question.

(d) S1 and S2 together are not sufficient to answer the Question.

Ans: (d)

Explanation:

- **Using S1 alone:** S1 alone is not sufficient to answer the question because according to S1, 'n' is a prime number. Between 10 and 20, possible prime numbers are: 11, 13, 17 and 19.
- **Using S2 alone:** S2 alone is not sufficient to answer the question because according to S2, on dividing 'n' by 4 we get a remainder of 1. Between 10 and 20, possible numbers could be 13 and 17.
- **Using both S1 and S2:** After using both the statements, we get two numbers i.e., 13 and 17.
- Hence, we can say that even S1 and S2 together are not sufficient to answer the question. **Therefore, option (d) is the correct answer.**

104. Two Statements S1 and S2 are given below with regard to two numbers followed by a Question: **(2020)**

S1: Their product is 21.

S2: Their sum is 10.

Question:

What are the two numbers?

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

(a) S1 alone is sufficient to answer the Question.

(b) S2 alone is sufficient to answer the Question.

(c) S1 and S2 together are sufficient to answer the Question, but neither S1 alone nor S2 alone is sufficient to answer the Question.

(d) S1 and S2 together are not sufficient to answer the Question.

Ans: (c)

Explanation:

- **Using S1 alone:** S1 alone is not sufficient to answer the question because according to S1, the product of the numbers should be 21. Therefore, numbers can be: (3, 7) or (1, 21)
- **Using S2 alone:** S2 alone is not sufficient to answer the question because according to S2, the sum of the numbers is 10. Therefore, the numbers can be: (1, 9), (2, 8), (3, 7), (4, 6) or (5, 5).
- **Using both S1 and S2:** After combining both the statements together, it is clear that the required two numbers with product of 21 and sum of 10 are: (3, 7)
- Hence, we can say that both S1 and S2 are required to answer the question. **Therefore, option (c) is the correct answer.**

105. A man walks down the backside of his house straight 25 metres, then turns to the right and walks 50 metres again; then he turns towards left and again walks 25 metres: If his house faces to the East, what his dirtetion from the starting point? **(2020)**

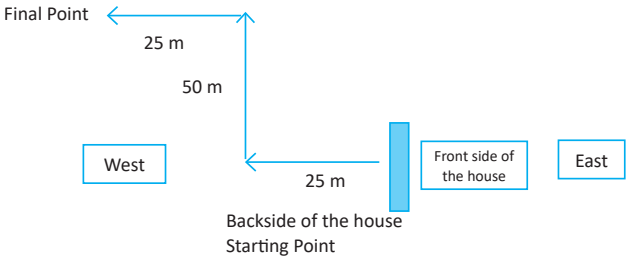
(a) South-East (b) South-West

(c) North-East (d) North-West

Ans: (d)

***Explanation*:**

- The path taken by man is represented by the following figure:



- It is clear from the diagram that man will be currently in the north-west direction from the starting point. **Therefore, option (d) is the correct answer.**

106. Two Statements are given followed by two Conclusions: **(2020)**

Statements:

All numbers are divisible by 2.

All numbers are divisible by 3.

Conclusion-I:

All numbers are divisible by 6.

Conclusion-II:

All numbers are divisible by 4.

Which of the above Conclusions logically follows/follow from the two given Statements?

(a) Only Conclusion-I

(b) Only Conclusion-II

(c) Neither Conclusion-I nor Conclusion-II

(d) Both Conclusion-I and Conclusion-II

Ans: (a)

Explanation:

- **Conclusion-I:** According to divisibility rule of 6, If a number is divisible by 3 and 2, then it will surely be divisible by 6 (which is 2 x 3). **Hence, it is correct.**
- **Conclusion-II:** All numbers which are divisible by 2 and 3 need not be divisible by 4. **Hence, it is not correct. Therefore, option (a) is the correct answer.**

107. Two Statements are given followed by two Conclusions: **(2020)**

Statements:

All cats are dogs.

All cats are black.

Conclusion-I:

All dogs are black.

Conclusion-II:

Some dogs are not black.

Which of the above logically follows/follow two given Statements, commonly known facts?

(a) Only Conclusion-I

(b) Only Conclusion-II

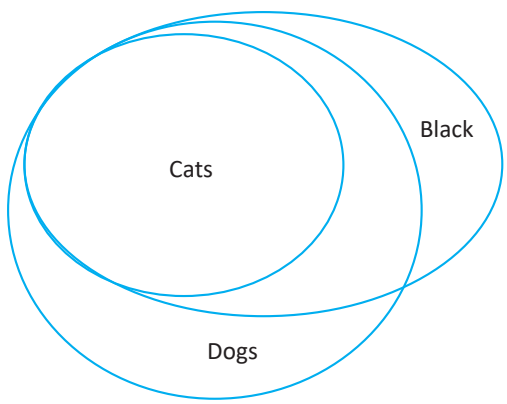
(c) Neither Conclusion-I nor Conclusion-II

(d) Both Conclusion-I and Conclusion-II

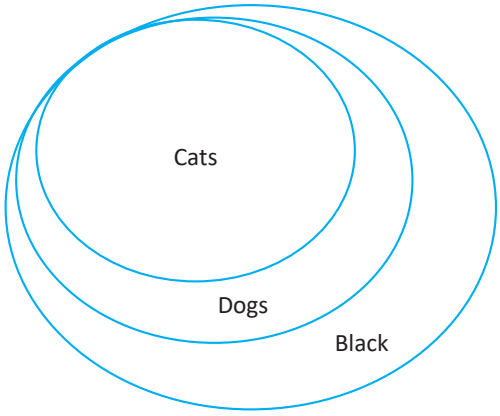
Ans: (c)

Explanation:

- Based on the statements, the possible cases are given below:



- **Conclusion-I:** From the above diagram, it is clear that the conclusion "All dogs are black" is not always true. **Hence, it is not correct.**



- **Conclusion-II:** From this diagram, it is clear that the conclusion "Some Dogs are not black" is not always true. **Hence, it is not correct. Therefore, option (c) is the correct answer.**

108. Consider the following sequence of numbers: **(2020)**

5 1 4 7 3 9 8 5 7 2 6 3 1 5

8 6 3 8 5 2 2 4 3 4 9 6

How many odd numbers are followed by the odd number in the above sequence?

(a) 5 (b) 6

(c) 7 (d) 8

Ans: (b)

Explanation:

- Given sequence is 5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6.
- It happens for six times when, an odd number is followed by another odd number (5 – 1, 7 – 3, 3 – 9, 5 – 7, 3 – 1, and 1 – 5). **Therefore, option (b) is the correct answer.**

109. A is 16th from the left end in a row of boys and V is 18th from the right end. G is 11th from A towards the right and 3rd from V towards the right end. How many boys are there in the row? **(2020)**

(a) 40

(b) 41

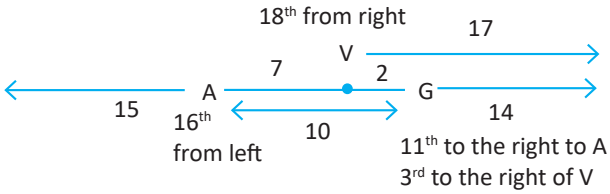
(c) 42

(d) Cannot be determined due to insufficient data

Ans: (b)

Explanation:

- As per the information given, it can be represented through the following diagram:



- As seen in the diagram, A is 16th from left end. Therefore, 15 students are there to the left of A. G is 11th from A towards right and 3rd from V towards the right. So, there are 7 students between A and V, and 2 students between V and G.
- Hence, there are 14 students to the right of G. So, including A, V, and G, the total number of students = 15 + 7 + 2 + 14 + A(1) + V(1) + G(1) = 41. **Therefore, option (b) is the correct answer.**

110. Three Statements S1, S2 and S3 are given below followed by a Question: **(2020)**

S1: C is younger than D, but older than A and B.

S2: D is the oldest.

S3: A is older than B.

Question:

Who among A, B, C and D is the youngest?

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

(a) S1 alone is sufficient to answer the Question.

(b) S1 and S2 together are sufficient to answer the Question.

(c) S2 and S3 together are sufficient to answer the Question.

(d) S1 and S3 together are sufficient to answer the Question.

Ans: (d)

Explanation:

- **Option (a):** S1 alone is not sufficient to answer the question because no information is given to find who is younger between A and B. **Hence, it is not correct.**
- **Option (b):** S1 and S2 together will not be sufficient to answer the question because, again, no information is given to find who is younger between A and B. **Hence, it is not correct.**
- **Option (c):** S2 and S3 together will not be sufficient to answer the question because no information is given about C. **Hence, it is not correct.**

- **Option (d):** S1 and S3 together will be sufficient to answer the question because the given information will give sequence D > C > A > B. So, the youngest person is 'B.' **Therefore, option (d) is the correct answer.**

111. The letters from A to Z are numbered from 1 to 26 respectively. If GHI = 1578 and DEF = 912, then what is ABC equal to? **(2020)**

(a) 492 (b) 468
(c) 262 (d) 246

Ans: (d)

Explanation:

- When letters are numbered in the same order as 1 to 26, then:

  GHI = 789

  DEF = 456

  ABC = 123

- When we multiply the above codes by 2:

  GHI = 789 × 2 = 1578

  DEF = 456 × 2 = 912

  ABC = 123 × 2 = 246.

- **Therefore, option (d) is the correct answer.**

112. What is the missing term @ in the following? **(2020)**

ACPQ: BESU:: MNGI: @

(a) NPJL (b) NOJM
(c) NPIL (d) NPJM

Ans: (d)

Explanation:

- The given sequence is – ACPQ : BESU :: MNGI : @.
- Here, A + 1 = B; C + 2 = E; P + 3 = S; Q + 4 = U
- So, ACPQ becomes BESU. Similarly, M + 1 = N; N + 2 = P; G + 3 = J; I + 4 = M.
- MNGI will become NPJM. **Therefore, option (d) is the correct answer.**

113. In a class, there are three groups A, B and C. If one student from group A and two students from group B are shifted to group C, then what happens to the average weight of the students of the class? **(2020)**

(a) It increases
(b) It decreases
(c) It remains the same
(d) No conclusion can be drawn due to insufficient data.

Ans: (c)

Explanation:

- The average weight of the class will change only when somebody joins the class or leaves the class. Otherwise, it will not change.
- In this case, there is no change in the number of students in the class, only they are reshuffled, from one group to another group of the same class. **Therefore, option (c) is the correct answer.**

114. Consider the following Statements and Conclusions: **(2019)**

Statements:

1. Some rats are cats.
2. Some cats are dogs.
3. No dog is a cow.

Conclusions:

I. No cow is a cat.
II. No dog is a rat.
III. Some cats are rats.

Which of the above conclusions is/are drawn from the statements?

(a) I, II and III (b) Only I and II
(c) Only III (d) Only II and III

Ans: (c)

Explanation:

- Based on the given statements, the information can be illustrated as below:

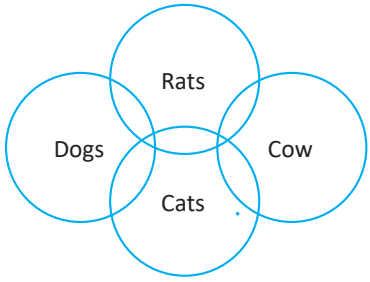


Fig. 1

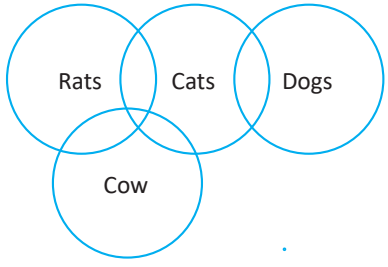


Fig. 2

- **Conclusion I:** As seen from the above figures, it cannot be definitely concluded that no cow is a cat. **Hence, it is not correct.**

- **Conclusion II:** As seen from the above figures, it cannot be definitely concluded that no dog is a rat. **Hence, it is not correct.**
- **Conclusion III:** As seen from the above figures, it can be definitely concluded that some cats are rats. **Hence, it is correct. Therefore, option (c) is the correct answer.**

115. In a conference, out of a total 100 participants, 70 are Indians. If 60 of the total participants are vegetarian, then which of the following statements is/are correct? **(2019)**

1. At least 30 Indian participants are vegetarian.
2. At least 10 Indian participants are non-vegetarian.

Select the correct answer using the codes given below:

(a) 1 only (b) 2 only

(c) Both 1 and 2 (d) Neither 1 nor 2

Ans: (c)

Explanation:

- As per the question, out of total 100 participants, 70 are Indians. So, number of non-Indians in the conference is: 100 – 70 = 30
- **Statement 1:** Given that, 60 of the total participants are vegetarian. Assuming that all 30 non-Indians are vegetarian, then at least 30 Indian participants are vegetarian. **Hence, it is correct.**
- **Statement 2:** Similarly, assuming that all 30 non-Indians are non-vegetarian, at least 10 Indian participants are non-vegetarian. **Hence, it is correct. Therefore, option (c) is the correct answer.**

116. A five-storeyed building with floors from I to V is painted using four different colours and only one colour is used to paint a floor. **(2019)**

Consider the following statements:

1. The middle three floors are painted in different colours.
2. The second (II) and the fourth (IV) floors are painted in different colours.
3. The first (I) and the fifth (V) floors are painted red.

To ensure that any two consecutive floors have different colours

(a) Only statement 2 is sufficient

(b) Only statement 3 is sufficient

(c) Statement 1 is not sufficient, but statement 1 along with statement 2 is sufficient

(d) Statement 3 is not sufficient, but statement 3 along with statement 2 is sufficient

Ans: (b)

Explanation:

- **Statement 1:** The middle three floors are painted in different colours. Here, two conditions are possible when consecutive floors can be of same colour.
  - I and II floor can be of same colour.
  - IV and V floor can be of the same colour.
- **Statement 2:** The second (II) and the fourth (IV) floors are painted in different colours. Here, four conditions are possible when consecutive floors can be of the same colour.
  - I and II floor can be of same colour.
  - II and III floor can be of same colour.
  - III and IV floor can be of same colour.
  - IV and V can be of same colour.
- **Statement 3:** The first (I) and the fifth (V) floors are painted red. Here, it can be concluded that no two consecutive floors have same colour. As floor have to be painted in 4 different colours. So, three different colours are left for second, third and fourth. Therefore, from this statement it can be ensured that two consecutive floors have different colours. Hence, only statement 3 is sufficient to ensure that two consecutive floors have different colours. **Therefore, option (b) is the correct answer.**

117. In a school, 60% students play cricket. A student who does not play cricket, plays football. Every football player has got a two-wheeler. Which of the following conclusions cannot be drawn from the above data? **(2019)**

1. 60% of the students do not have two-wheelers.
2. No cricketer has a two-wheeler.
3. Cricket players do not play football.

Select the correct answer using the code given below:

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

(c) 1 and 3 only (d) 1, 2 and 3

Ans: (d)

Explanation:

- As per the data given in the question, 60% students play cricket. So, 40% students play football.
- **Statement 1:** "60% of students do not have 2-wheeler." We know that all football players have two-wheelers, but it is not clearly given in the question that the remaining 60% students do not have two-wheelers. Given data is insufficient to evaluate the correctness of this conclusion. **Hence, it is not correct.**
- **Statement 2:** "No cricketer has a 2-wheeler." It is not clearly given in the question if the cricketers are having, or not having, the two-wheelers. Given data is insufficient to evaluate the correctness of this conclusion. **Hence, it is not correct.**

- **Statement 3:** "Cricket players do not play football." It is given in the question that a student who does not play cricket, plays football. But nothing is given in the question if they are mutually exclusive students, i.e., who plays cricket does not play football and vice versa. Given data is insufficient to evaluate the correctness of this conclusion. **Hence, it is not correct. Therefore, option (d) is the correct answer.**

118. If x is greater than or equal to 25 and y is less than or equal to 40, then which one of the following is always correct? **(2019)**

(a) x is greater than y

(b) (y – x) is greater than 15

(c) (y – x) is less than or equal to 15

(d) (x + y) is greater than or equal to 65

Ans: (c)

Explanation:

- As per the given data, 'x' is greater than or equal to 25 and 'y' is less than or equal to 40.
- Thus, 'x' can take any value more than or equal to 25, 'y' can take any value less than or equal to 40. Now let us check the given options.
- **Option (a):** 'x' is greater than 'y'. Suppose x = 26 and y = 39 or x = 25 and y = 40. Values of 'x' and 'y' satisfies the conditions given in the question, but 'x' is still smaller. **Hence, it is not correct.**
- **Option (b):** (y – x) is greater than 15. Suppose x = 28 and y = 37 (then, x – y = 37 – 28 = 9). Values of 'x' and 'y' satisfies the conditions given in the question, but (x – y) is not always greater than 15. **Hence, it is not correct.**
- **Option (c):** (y – x) is less than or equal to 15. For example, x = 25 and y = 40 or x = 26 and y = 39, then (y – x) cannot exceed 15. **Hence, it is correct.**
- **Option (d):** (x + y) is greater than or equal to 65. For example, x = 25 and y = 30, then: (x + y) = (25 + 30) = 55**. Hence, it is not correct. Therefore, option (c) is the correct answer.**

119. A wall clock moves 10 minutes fast in every 24 hours. The clock was set right to show the correct time at 8:00 a.m. on Monday. When the clock shows the time 6.00 pm on Wednesday, what is the correct time? **(2019)**

(a) 5:36 p.m. (b) 5:30 p.m.

(c) 5:24 p.m. (d) 5:18 p.m.

Ans: (a)

Explanation:

- It is given that clock moves 10 minutes fast in every 24 hours.
- The total hours from 8 a.m. on Monday till 6 p.m. on Wednesday: 24 + 24 + 10 = 58 hours.
- Clock will move fast in 58 hrs: 10/24 × 58 = 24 minutes.
- Thus, the correct time will be: 6 p.m. – 24 mins = 5:36 p.m. **Therefore, option (a) is the correct answer.**

120. Consider the following sequence that follows some arrangement: **(2019)**

c_accaa_aa_bc_b

The letters that appear in the gaps are

(a) abba (b) cbbb

(c) bbbb (d) cccc

Ans: (b)

Explanation:

- Let's check the options by placing the given letters in the series given to find the sequence or a pattern.
- **Option (a):** c (a) accaa (b) aa (b) bc (a) b
- **Option (b):** c (c) accaa (b) aa (b) bc (b) b
- **Option (c):** c (b) accaa (b) aa (b) bc (b) b
- **Option (d):** c (c) accaa (c) aa (c) bc (c) b.
- Thus, option (b) follows the sequence of 5 letters: ccacc, aabaa, bbcbb**. Therefore, option (b) is the correct answer.**

121. Consider two statements S1 and S2 followed by a question: **(2019)**

S1: p and q both are prime numbers.

S2: p + q is an odd integer.

Question: Is pq an odd integer?

Which one of the following is correct?

(a) S1 alone is sufficient to answer the question

(b) S2 alone is sufficient to answer the question

(c) Both S1 and S2 taken together are not sufficient to answer the question

(d) Both S1 and S2 are necessary to answer the question

Ans. (b)

Explanation

- **S1:** p and q both are prime numbers. It is given that p and q both are prime numbers, but except 2, all prime numbers are odd. Hence, (p × q) cannot be concluded because if 2 is used then the outcome of (p × q) would be even. But, if 2 is not used then the (p × q) will be odd integer. Here, it is not clearly given that 2 is used or not. **Hence, S1 alone is not sufficient to answer the question.**
- **S2:** (p + q) is an odd integer. If both the numbers are odd then the outcome of their addition is even, and if both the numbers are even then the outcome of their addition is even. Thus, one number is odd and other number is even

in this addition providing an odd outcome. Hence, (p × q) will be an odd integer. **Hence, S2 alone is sufficient to answer the question. Therefore, option (b) is the correct answer.**

122. If every alternative letter of the English alphabet from B onwards (including B) is written in lower case (small letters) and the remaining letters are capitalized, then how is the first month of the second half of the year written? **(2019)**

(a) JuLY (b) jULy

(c) jUly (d) jUlY

Ans: (d)

Explanation:

- If we write the English alphabet according to the conditions given in the question, we will get the 26 letters as A b C d E f G h I j K l M n O p Q r S t U v W x Y z.
- So, July will be written as jUlY. **Therefore, option (d) is the correct answer.**

123. In the sequence 1, 5, 7, 3, 5, 7, 4, 3, 5, 7, how many such 5s are there which are not immediately preceded by 3 but are immediately followed by 7? **(2019)**

(a) 1 (b) 2

(c) 3 (d) None

Ans: (a)

Explanation:

- In the given sequence 1, 5, 7, 3, 5, 7, 4, 3, 5, 7, there is only one such 5 that is not preceded immediately by 3, but immediately followed by 7. **Therefore, option (a) is the correct answer.**

124. A joint family consists of seven members A, B, C, D, E, F and G with three females. G is a widow and sister-in-law of D's father F. B and D are siblings and A is daughter of B. C is cousin of B. Who is E? **(2019)**

1. Wife of F
2. Grandmother of A
3. Aunt of C

Select the correct answer using the code given below:

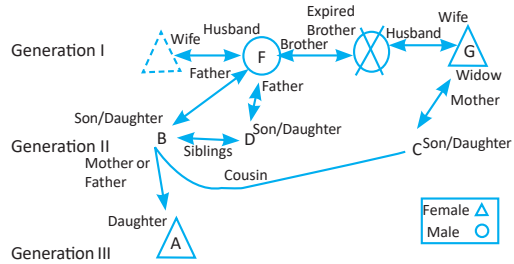
(a) 1 and 2 only (b) 2 and 3 only

(c) 1 and 3 only (d) 1, 2 and 3

Ans: (d)

Explanation:

- As per the data given in the question, we can make a family tree.



- As per the data given, D and F are male.
- In this family we can find only two females i.e., G and A. But this family have three females. That means E is the 3rd female (also we can conclude this because of the options given in the question).
- E is female. If we assume that she is wife of B, then all the given conditions in the question becomes contradictory, as E becomes daughter-in-law of F, mother of A and sister-in-law of C.
- So, let us assume that she is wife of F. It means that E is sister-in-law of G, mother of D and B, grandmother of A, aunt of C. **Therefore, option (d) is the correct answer.**

125. How many triplets (x, y, z) satisfy the equation x + y + z = 6, where x, y and z are natural numbers? **(2019)**

(a) 4 (b) 5

(c) 9 (d) 10

Ans: (d)

Explanation:

- As per the question, x, y and z are natural numbers. So, x, y and z will be greater than zero. It also means that minimum 1 will be there at all places in (x, y, z).
- By hit and trial method, we get 10 sets of triplets: (1, 2, 3), (1, 3, 2), (2, 1, 3), (2, 3, 1), (3, 1, 2), (3, 2, 1), (1, 1, 4), (1, 4, 1), (4, 1, 1), (2, 2, 2) are 10 such triplets. **Therefore, option (d) is the correct answer.**

126. If $ means 'divided by'; @ means 'multiplied by'; # means 'minus', then the value of 10#5@1$5 is **(2019)**

(a) 0 (b) 1

(c) 2 (d) 9

Ans: (d)

Explanation:

- After simplifying the expression as per the conditions given in the question, we get: 10#5@1$5 $\Rightarrow$ 10 – 5 × 1 ÷ 5
- Applying BODMAS rule to the given expression: 10 – 5 × (1/5) = 10 – 1 = 9. **Therefore, option (d) is the correct answer.**

Directions for the following 3 (three) items:

*Read the following information and answer the **three** items that follow:*

Six students A, B, C, D, E and F appeared in several tests. Either C or F scores the highest. Whenever C scores the highest, then E scores the least. Whenever F scores the highest, B scores the least.

In all the tests they got different marks; D scores higher than A, but they are close competitors; A scores higher than B; C scores higher than A. **(2019)**

127. If F stands second in the ranking, then the position of B is

(a) Third (b) Fourth

(c) Fifth (d) Sixth

Ans: (c)

Explanation:

- As per the given data,
  - Six students A, B, C, D, E and F appeared in several tests.
  - Either C or F scores the highest.
  - Whenever C scores the highest, then E scores the least.
  - Whenever F scores the highest, B scores the least.
  - In all the tests they got different marks;
  - D scores higher than A, but they are close competitors;
  - A scores higher than B;
  - C scores higher than A
- As per the given data, F stands second in the ranking, it means C stands first and E stands at last position. By using the given data, this is the sequence we have C-F-D-A-B-E. Thus, position of B is fifth. **Therefore, option (c) is the correct answer.**

128. If B scores the least, the rank of C will be

(a) Second (b) Third

(c) Fourth (d) Second or third

Ans: (d)

Explanation:

- As per the given data, B scores least, that means F scored highest. So, out of six positions, the first and last positions are fixed i.e., F _ _ _ _ B.
- The middle four positions can be arranged in order E, C, D and A. Here, anything about E is not provided, but C, D and A will come in the following order: F _ C _ D _ A _ B.
- In either case, C will either occupy second or third place. **Therefore, option (d) is the correct answer.**

129. If E is ranked third, then which one of the following is correct?

(a) E gets more marks than C

(b) C gets more marks than E

(c) A is ranked fourth

(d) D is ranked fifth

Ans: (b)

Explanation:

- As per the given data, E is ranked third, it means it is not last. It means C is not first and thus, F is first and B is last. So, we get: F _ E _ _ B.
- As per the given data, D scores higher than A, but they are close competitors. So, they will come together. Thus, we get: F _ E-D-A-B
- Thus, only one position is remaining, where C can be placed. So, we have the following arrangement: F-C-E-D-A-B.
- In the above case, C gets more marks than E. **Therefore, option (b) is the correct answer.**

Directions for the following 2 (two) items:

*Read the following statements S1 and S2 and answer the **two** items that follow:*

S1: Twice the weight of Sohan is less than the weight of Mohan or that of Rohan.

S2: Twice the weight of Rohan is greater than the weight of Mohan or that of Sohan. **(2019)**

130. Which one of the following statements is correct?

(a) Weight of Mohan is greatest

(b) Weight of Sohan is greatest

(c) Weight of Rohan is greatest

(d) 'Whose weight is greatest' cannot be determined

Ans: (d)

Explanation:

- Let us assume that weight of Sohan = S, weight of Mohan = M and weight of Rohan = R.
- **Statement 1:** 2S < M, even double of S is less than M. So, S < M. 2S < R, even double of S is less than R. So, S < R. So, we can conclude that weight of Sohan (S) is less than weight of Mohan (M) and Rohan (R). But no data is provided to establish the relation between M and R. Hence, whose weight is the greatest can't be determined. **Therefore, option (d) is the correct answer.**

131. Which one of the following statements is correct?

(a) Weight of Mohan is least

(b) Weight of Sohan is least

(c) Weight of Rohan is least

(d) Whose weight is least cannot be determined

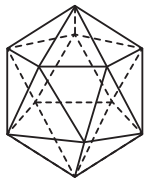
Ans: (b)

Explanation:

- **Statement 1:** 2S < M and 2S < R, so, it can be concluded that the weight of Sohan (S) is less than weight of both Mohan (M) and Rohan (R).

- **Statement 2:** 2R > M, means either R = M or R > M or R < M. We cannot conclude relation between weight of Rohan (R) and Mohan (M). 2R > S is obvious as we have concluded weight of Rohan (R) > weight of Sohan (S) above. **Therefore, option (b) is the correct answer.**

132. Consider the following three-dimensional figure **(2018)**



How many triangles does the above figure have?

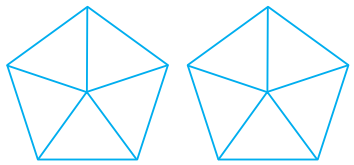
(a) 18 (b) 20

(c) 22 (d) 24

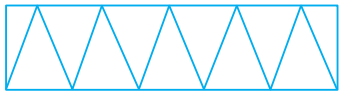
Ans: (b)

Explanation:

- It can be observed that the given three-dimensional figure has 5 triangles on the top and 5 triangles on the bottom.

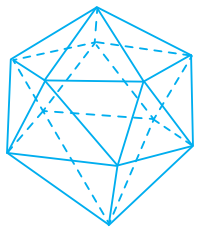


- In the middle portion, 5 triangles are visible in the front. Similarly, 5 triangles are there at the back.



- Hence, the figure has a total of 20 triangles. **Therefore, option (b) is the correct answer.**

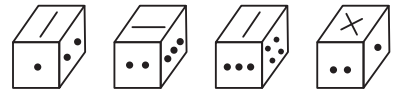
Alternate Method:



- Triangles with solid sides = 10
- Triangles with both solid and dotted sides = 6
- Triangles with dotted sides only = 4
- Hence, the total triangle in this figure is 20. **Therefore, option (b) is the correct answer.**

Directions for the following 3 (three) items:

Rotated positions of a single solid are shown below. The various faces of the solid are marked with different symbols like dots, cross and line. Answer the three items that follow the given figures. **(2018)**



133. What is the symbol on the face opposite to that containing a single dot?

(a) Four dots

(b) Three dots

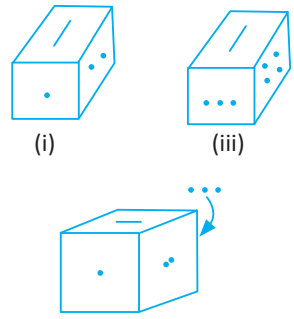
(c) Two dots

(d) Cross

Ans: (b)

Explanation:

- By observing figure (I) and figure (II), it can be concluded that three dots symbol are opposite to single dot. **Therefore, option (b) is the correct answer.**



134. What is the symbol on the face opposite to that containing two dots?

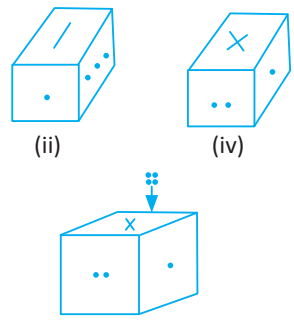
(a) Single dot (b) Three dots

(c) Four dots (d) Line

Ans: (c)

Explanation:

- By observing figure (II) and figure (IV), it can be concluded that four dots are opposite to two dots. **Therefore, option (c) is the correct answer.**



135. What is the symbol on the face opposite to that containing the cross?

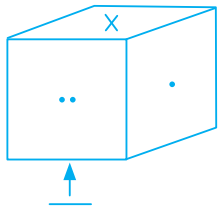
(a) Single dot (b) Two dots

(c) Line (d) Four dots

Ans: (c)

Explanation:

- By observing figures (I), (II), (III), and (IV), it can be concluded that the line is opposite to the cross. **Therefore, option (c) is the correct answer.**



136. If LSJXVC is the code for MUMBAI, the code for DELHI is **(2018)**

(a) CCIDD (b) CDKGH

(c) CCJFG (d) CCIFE

Ans: (a)

Explanation:

- It is given that MUMBAI is coded as LSJXVC. Here it can be observed that the letters of the English alphabets used in the word are subtracted in succession as below:

  M – 1 = L, U – 2 = S, M – 3 = J, B – 4 = X, A – 5 = V, I – 6 = C.
- Similarly, we can arrive at the code for DELHI by applying the same subtraction process. We get, D – 1 = C, E – 2 = C, L – 3 = I, H – 4 = D, I – 5 = D
- Thus, DELHI can be coded as CCIDD. **Therefore, option (a) is the correct answer.**

137. If RAMON is written as 12345 and DINESH as 675849, then HAMAM will be written as **(2018)**

(a) 92233 (b) 92323

(c) 93322 (d) 93232

Ans: (b)

Explanation:

- It is given that RAMON is written as 12345 and DINESH as 675849. This can be illustrated as below:

Letter → Code	
R → 1	D → 6
A → 2	I → 7
M → 3	N → 5
O → 4	E → 8
N → 5	S → 4
	H → 9

- From the above figure, we can observe that 9 → H, 2 → A, and 3 → M.
- Hence, HAMAM will be written as 92323. **Therefore, option (b) is the correct answer.**

Directions for the following 2 (two) items:

Read the following information and answer the two items that follow.

The plan of an office block for six officers A, B, C, D, E and F is as follows: Both B and C occupy offices to the right of the corridor (as one enters the office block) and A occupies on the left of the corridor. E and F occupy offices on opposite sides of the corridor but their offices do not face each other. The offices of C and D face each other. E does not have a corner office. F's office is further down the corridor than A's, but on the same side. **(2018)**

138. If E sits in his office and faces the corridor, whose office is to his left?

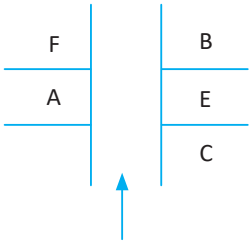
(a) A (b) B

(c) C (d) D

Ans: (c)

Explanation:

- As per the given information, the sitting arrangement can be illustrated as the following:



- As we can see, if E sits in his office and faces the corridor, C's office will be to his left. **Therefore, option (c) is the correct answer.**

139. Who is/are Fs immediate neighbour/neighbours?

(a) A only (b) A and D

(c) C only (d) B and C

Ans: (a)

Explanation:

- As we can see clearly from figure, A is the immediate neighbour of F.
- Also, we can observe that F is having no other immediate neighbour than A. **Therefore, option (a) is the correct answer.**

140. A solid cube of 3 cm side, painted on all its faces, is cut up into small cubes of 1 cm side. How many of the small cubes will have exactly two painted faces? **(2018)**

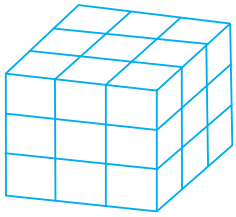
(a) 12 (b) 8

(c) 6 (d) 4

Ans: (a)

Explanation:

- After cutting the solid cube of 3×3×3 sides, a total of 27 cubes of 1×1×1 sides can be formed.
- Eight cubes at the corners can be neglected because three of their faces are painted.
- One central cube can also be excluded because its face is unpainted.
- Since only one face is painted, the middle cubes of each face can be eliminated. This adds up six cubes.
- The rest of the cubes (1×1×1) will be painted on two faces.
- Thus, 27 – (8+1+6) = 12 small cubes (1x1x1) will have exactly two painted faces. **Therefore, option (a) is the correct answer.**



141. If Pen < Pencil, Pencil < Book and Book > Cap, then which one of the following is always true? **(2018)**

(a) Pen > Cap (b) Pen < Book

(c) Pencil = Cap (d) Pencil > Cap

Ans: (b)

Explanation:

- From the information given in the question we get: Pen < Pencil < Book > Cap
- Thus, we can clearly conclude that Pen < Book. **Therefore, option (b) is the correct answer.**

Directions for the following 6 (six) items:

Read the information given below and answer t he six items that follow.

A, B, C and D are students. They are studying in four different cities, viz., P, Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different States, viz., Gujarat, Rajasthan, Assam and Kerala (not necessarily in that order). Further, it is given that – **(2018)**

(i) D is studying in Assam

(ii) Arts college is located in city S which is in Rajasthan

(iii) A is studying in Commerce college

(iv) B is studying in city Q

(v) Science college is located in Kerala

142. A is studying in

(a) Rajasthan (b) Gujarat

(c) city Q (d) Kerala

Ans: (b)

Explanation:

- The following information is given:

  There are 4 students: A, B, C, and D.

  There are 4 states: Gujarat, Kerala, Rajasthan and Assam.

  There are 4 cities: P, Q, R, and S.

  There are 4 colleges: Science, Commerce, Arts, and Engineering.
- As per given information, we can arrive at the following table:

Student	City	College	State
A	P/R	Commerce	Gujarat
B	Q	Science	Kerala
C	S	Arts	Rajasthan
D	P/R	Engineering	Assam

- From the above table it is clear that A is studying in Gujarat. **Therefore, option (b) is the correct answer.**

143. Science college is located in

(a) city Q (b) city S

(c) city R (d) city P

Ans: (a)

Explanation:

- From the above table it is clear that Science college is located in city Q. **Therefore, option (a) is the correct answer.**

144. C is studying in

(a) Science college (b) Rajasthan

(c) Gujarat (d) city Q

Ans: (b)

Explanation:

- From the above table it is clear that C is studying in Rajasthan. **Therefore, option (b) is the correct answer.**

145. Which one of the following statements is correct?

(a) D is not studying in city S.

(b) A is studying in Science college.

(c) A is studying in Kerala.

(d) Engineering college is located in Gujarat.

Ans: (a)

Explanation:

- From the above table it is clear that D studies in city R and not in city S. **Therefore, option (a) is the correct answer.**

146. Which one of the following statements is correct regarding Engineering college?

(a) C is studying there.

(b) B is studying there.

(c) It is located in Gujarat.

(d) D is studying there.

Ans: (d)

Explanation:

- From the above table it is clear that D studies in Engineering college. **Therefore, option (d) is the correct answer.**

147. Which one of the following statements is correct?

(a) Engineering college is located in Assam.

(b) City Q is situated in Assam

(c) C is studying in kerala.

(d) B is studying in Gujarat.

Ans: (a)

Explanation:

- From the above table it is clear that Engineering college is located in Assam and the remaining statements are incorrect. **Therefore, option (a) is the correct answer.**

148. Consider the sequence given below: **(2018)**

4/12/95, 1/1/96, 29/1/96, 26/2/96,....

What is the next term of the series?

(a) 24/3/96 (b) 25/3/96

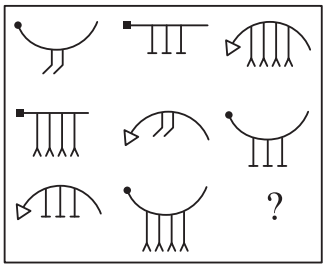
(c) 26/3/96 (d) 27/3/96

Ans: (b)

Explanation:

- The given data can be read as the dates in DD/MM/YY format. As per the given information it can be observed that the dates are increasing by 28 days.
- For example, 4/12/95 + 28 days = 1/1/96, 1/1/96 + 28 days = 29/1/96, 29/1/96 + 28 days = 26/2/96.
- Hence, next term of the series will be 26/2/96 + 28 days = 25/3/96. Also, it should be noticed that the year 1996 was a leap year and therefore during the calculations 29th February has been taken into consideration. **Therefore, option (b) is the correct answer.**

149. Consider the figures given below: **(2018)**



To fit the question mark, the correct answer is

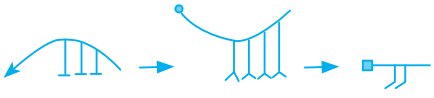
(a)  (b) 

(c)  (d) 

Ans:(a)

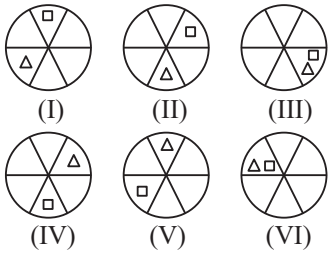
Explanation:

- We can observe that every figure has three parts, i.e., head, middle segment and the bottom.
- There are three types of heads viz., dot, square and a triangle.
- Similarly, there are three types of middle segment viz., straight line, u-curved and reverse u-curved.
- And the bottom too is of three types viz., two-legged, three-legged and four-legged.
- Now, on observing we can see that each of the three parts are moving in a certain pattern and creating a resultant figure.
- The heads and middle segments are moving towards their left, while the bottoms are moving towards their right.
- Based on the operation discussed above we can arrive at the next figure as below:



- **Therefore, option (a) is the correct answer.**

150. Consider the following figures: **(2018)**



In the figures (I) to (VI) above, some parts are shown to change their positions in regular directions. Following the same sequence, which of the figures given below will appear at (VII) stage?

(a) 

(b) 

(c) 

(d) 

Ans: (b)

Explanation:

- By analyzing the figures, it can be concluded Δ is moving anti-clockwise and □ is moving clockwise. **Therefore option (b) is the correct answer.**

151. Lakshmi, her brother, her daughter and her son are badminton players. A game of doubles is about to begin: **(2018)**

(i) Lakshmi's brother is directly across the net from her daughter.

(ii) Her son is diagonally across the net from the worst player's sibling.

(iii) The best player and the worst player are on the same side of the net.

Who is the best player?

(a) Her brother (b) Her daughter

(c) Her son (d) Lakshmi

Ans: (a)

Explanation:

- As per the question, Lakshmi's brother is directly across the net from her daughter.

Brother

---------- Net

Daughter

- Lakshmi's son is diagonally across the net from the worst player's sibling.
  - **Condition 1:** If Lakshmi is the worst player, then the son will be diagonally across Lakshmi's brother.

Brother Lakshmi

---------- Net

Daughter Son

  - **Condition 2:** Lakshmi's son is the worst player, then the son will be diagonally across Lakshmi's daughter.

Brother Son

---------- Net

Daughter Lakshmi

- The best and worst player are on the same side of the net.
- Hence, in both the conditions, Lakshmi's brother is the best player. **Therefore, option (a) is the correct answer.**