CDC 11 2022 QA

Q 1. From the first ‘n’ consecutive even natural numbers written on a blackboard, one of the numbers is removed. If the average of the remaining numbers remains is 32, then which of the following cannot be the value of ‘n’?

1) 31

2) 32

3) 30

4) 34

Q 2. Rohan had to pick his wife from home since they had planned to go for a movie. He planned to reach home from office and leave immediately to the movie hall. The movie hall and their home were in opposite directions from Rohan’s office. Since he got delayed by 20 minutes, he asked his wife to pick an auto and come towards his office. His home was a 50 minute drive from his office. He asked her to start from her home at the moment he left his office towards his home. He picked her on the way and they managed to reach the venue just in time for the movie. If Rohan drives at an average speed of 80 km/h, find the speed (in km/h) of the auto-rickshaw.

Q 3. Raju has three clocks A, B and C. Once an alarm goes off on A, it rings continuously for 10 seconds, then pauses, then starts ringing again for 10 seconds after 2 minutes, and so on. The respective values for Clock B are 20 seconds and 4 minutes, and for Clock C are 30 seconds and 6 minutes. An alarm is set in each of the three Clocks for 06:00 AM. What time after 06:00 AM will the three alarms go off simultaneously for the first time again?

1) 06:06 AM

2) 06:13 AM

3) 06:30 AM

4) 06: 33 AM

Q 4. A person has just sufficient money to buy either 30 guavas, 50 plums or 70 peaches. He spends 20% of the money on travelling, and buys 14 peaches, ‘x’ guavas and ‘y’ plums using rest of the money. If x, y > 0, what is the minimum value of the sum of x and y?

1) 22

2) 20

3) 26

4) 24

Q 5. In triangle ABC, side AC and the perpendicular bisector of BC meet in point D, and BD bisects ∠ABC. If AD = 9 and DC = 7, what is the area of triangle ABD?

1) 14

2) 28

3) $14\sqrt{5}$

4) $28\sqrt{5}$

Q 6. Ajay left Hyderabad for Bengaluru at 6 AM. At 9:30 AM, Bhaskar left Hyderabad for Bengaluru at a speed that was 12 km/h more than the speed of Ajay. At 4:30 PM on the same day, the two were 91 km apart. If their cars had travelled with no halts, find the speed (in km/h) of car in which Ajay is travelling.

1) 40

2) 50

3) 60

4) Cannot be determined

Q 7. A society of 385 people organized a tournament comprising three different games. The number of people who participated in at least two games was 42% more than those who participated in exactly one game. What is the minimum number of people who did not participate in any game?

1) 0

2) 17

3) 22

4) 72

Q 8. A table of 'n' rows and 'n' columns is created such that the value of the cell in the ith row and the jth column is given by (i + 1) + j. Some numbers are selected from the table. If it is found that exactly one number has been selected from each row and each column, then the sum of the selected numbers will be equal to

1) $n^2 + 1$

2) $n(n + 1)/2$

3) $n(n + 2)$

4) $n(n + 1)$

Q 9. The product of the first five terms of an increasing arithmetic progression is 40/81. If the 1st, 2nd and 4th terms of the arithmetic progression are in geometric progression, what is the sum of the 1st term and the 5th term of the arithmetic progression?

Q 10. P, Q, R and S are four points on the circumference of a circle such that SR is a diameter of the circle. The point of intersection L of PR and QS lies inside the circle. If $\angle PRQ = x°$, $\angle PQS = (x - 10)°$ and $\angle QSR = (x + 10)°$, then the measure of $\angle SLR$ is

1) 90°

2) 120°

3) 100°

4) Cannot be determined

Q 11. How many non-negative integral pairs (m, n) satisfy the condition $0 < m \times n \leq m + n$ such that $m, n < 50$?

Q 12. A school divided its students into various groups to manage the annual day celebrations. There were 3 groups of 9 each to coordinate Arts, 12 groups of 7 each to coordinate the hospitality, 17 groups of 3 each to manage the music events. The orientation for all these groups was done simultaneously in N rooms each of which had a capacity of 14 students. What is the least value of N to manage the orientation, if all students belonging to any group are all seated in the same room?

Q 13. The roots of the quadratic equation $x^2 - 24x + K = 0$ are both prime numbers. The difference between the maximum and the minimum values of K is

1) 23

2) 24

3) 43

4) 48

Q 14.

Suppose that a and b are digits, not both nine and not both zero, and the repeating decimal $0.\overline{ab}$ is expressed as a fraction in lowest terms. How many different numerators are possible if the denominator is less than 50?

Q 15. If $a_1 = 3$, $a_2 = 7$ and $a_n = 3a_{n-1} - 2a_{n-2}$ for $n \geq 3$, then the value of a_8 is

Q 16. The sum of the edges of a cuboid is 12. What is the maximum numerical value of the sum of its volume and its surface area?

Q 17. In year N, the 230th day of the year is a Tuesday. In year N + 1, the 130th day is also a Tuesday. On what day of the week did the 30th day of year N – 1 occur?

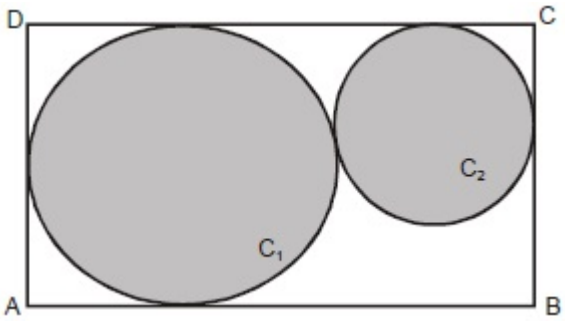
1) Monday

2) Thursday

3) Friday

4) Saturday

Q 18. In the figure given below, circle C_1 touches three sides of rectangle ABCD and circle C_2 touches the circle C_1 and two sides of the rectangle. If AB = 9 cm and BC = 8 cm, find the area (in cm^2) of the unshaded region of the rectangle.



1) 18

2) 18.57

3) 20.92

4) 24

Q 19. A bike running at 80 km/h initially is slowed down to 60 km/h as soon as the fuel indicator touches the half level mark. It keeps running at this speed till it runs out of fuel, thereby covering a total distance of 640 km in 10 hours. If the bike consumes 2.5 litres of fuel per hour, what is the capacity (in litres) of the fuel tank of the bike?

Q 20. A shopkeeper has 2031 apples, 2391 bananas and 2811 peaches. He makes N baskets of these fruits such that every basket has a apples, b bananas and c peaches. In the end the shopkeeper is left with k(< a, b, c) fruits of each type. Find the maximum possible value of N.

1) 1

2) 10

3) 30

4) 60

Q 21. The sum of the roots of the quadratic equation $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals. If a, b and c are real numbers, and $a \neq 0$, then bc^2, ca^2 and ab^2 are in

1) AP

2) GP

3) HP

4) None of these

Q 22. The common tangents of two circles of radii 10 cm and 5 cm intersect at 90°. What is the distance (in cm) between the centers of the circles?

I. $5\sqrt{2}$
II. $10\sqrt{2}$
III. $15\sqrt{2}$

1) II only

2) I & III

3) I & II

4) II & III
