Prime CAT 15 2022 QA

Q 1. A farmer sells one type of rice at Rs. 40 per kg and loses 20% and other type of rice at Rs. 50 per kg and gains 25%. If he mixes the two types in equal proportions and sells the mixture at Rs. 55 per kg, then the profit percentage is

1) 11.11%

2) 18.18%

3) 22.22%

4) 16.66%

Q 2. In a trapezium ABCD, AB and DC are parallel sides and $\angle ADC = 90°$. If AB = 16 cm, CD = 24 cm and diagonal AC = 30 cm, then the area (in sq. cm) of the trapezium ABCD is

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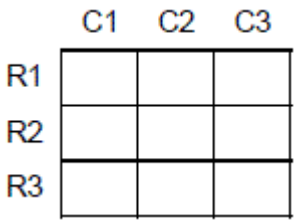
Q 3. Let f be a function such that $f(x) = f(x - 2) - f(x - 1)$ where $x \geq 3$. If x is a natural number and f(1) = 0, f(2) = 1, then what is the value of f(9)?

Q 4. '0' or '1' is placed in each of the 9 cells of a 3 × 3 grid. Each row and each column have both the digits '0' and '1' in it. If there are either 3 zeros or 3 one's in the grid, then in how many ways can this 3 × 3 grid be filled?



Q 5. A car overtakes a bus travelling from Delhi to Jaipur at 7:30 AM. The car reaches Jaipur at 9 AM. After stopping there for 1 hour, it starts back towards Delhi and meets the same bus at 10:30 AM, which was moving towards Jaipur at that time. If both the car and the bus were travelling at uniform speeds on the same route, what will be the time when the bus would reach Jaipur?

1) 11:00 AM

2) 11:30 AM

3) 12:00 PM

4) 12:30 PM

Q 6. What is the number of zeros at the end of $N = 5^5 \times 10^{10} \times 15^{15} \times \ldots \times 125^{125}$?

1) 1200

2) 1520

3) 2000

4) 2125

Q 7. A group of workers having equal efficiency can complete a job in 5 days. But it so happens that on every alternate day starting from the second day, 3 workers are withdrawn from the job and every alternate day starting from the third day 2 workers are added to the group. If it now takes 8 days to complete the job, find the number of workers who started the job.

1) 4

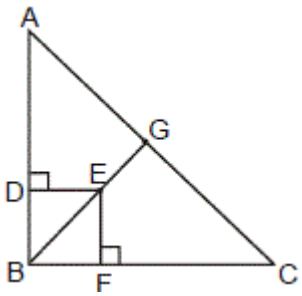
2) 5

3) 6

4) 8

Q 8. If the roots of the equation $x^2 + px + q = 0$ are two consecutive multiples of 5, then find the value of $(p^2/4) - q$.

Q 9. In the figure given below, triangle ABC is right angled at B, AB = 12 cm, BC = 5 cm and DE = EF. If BE is extended to meet AC at G, then find the length (in cm) of AG.



1) 55/17

2) 25/7

3) 156/17

4) 65/17

Q 10. Suraj appeared in six different papers in his semester examination, where the maximum marks were 50 for each paper. His marks in these papers are in the proportion 11 : 10 : 9 : 12 : 13 : 8. Considering his aggregate in all the papers together, he fails to obtain 50% of the total marks. What is the minimum possible additional marks Suraj should get to obtain 50% of the total marks, given that he got integral marks in each paper?

1) 20

2) 21

3) 12

4) 24

Q 11. If $||x - 5| - 3| \geq 1$, find the number of integral values of 'x' which doesn't satisfy the inequality.

1) 1

2) 2

3) 3

4) 4

Q 12. There is a sheet of paper. 'P' picks and tears it into 5 pieces. Then 'Q' comes and picks up at least one of the torn pieces and tears each of them into 5 pieces. Similarly, 'R' does the same thing. Which of the following can never be the number of pieces of paper in the end?

1) 73

2) 97

3) 105

4) 87

Q 13. A survey was conducted on how many people read books – A, B, C and D – in a group of 1000 people. Results show that 92% of the people surveyed read book A, 89% read book B, 80% read book C, and 72% read book D. What must be the minimum number of people who read all four books, if 20 people do not read any of the four books?

1) 390

2) 190

3) 380

4) 0

Q 14. PQ and RS are common tangents to two circles intersecting at A and B. AB, when produced both sides, meet the tangents PQ and RS at X and Y, respectively. If AB = 8 cm, XY = 10 cm, then PQ (in cm) will be

1) 4

2) 6

3) 8

4) 10

Q 15. Ketan and Jatin start simultaneously from P and reach R via Q along the same road. Ketan travels at 24 km/h from P to Q and at 30 km/h from Q to R. Jatin travels at 30 km/h from P to Q and at 24 km/h from Q to R. Ketan reaches R, 15 minutes before Jatin. How much more distance Ketan has traveled at 30 km/h as compared to the distance (in km) traveled at 24 km/h?

1) 25

2) 20

3) 15

4) 30

Q 16. The sequence $a_1, a_2, a_3, \ldots, a_{71}$ satisfied the condition $a_{n+1} = a_n + 2$ for n = 1, 2, 3, ..., 70. If the sum of all the terms a_1 through a_{71} is 2130, find the sum of all terms of the form a_{2n} in this series, where n is a natural number.

1) 1110

2) 1050

3) 960

4) 1015

Q 17. A solid sphere is cut into 16 identical pieces with 5 cuts. What is the percentage increase in the combined total surface area of all the pieces over that of the original sphere?

1) 350%

2) 150%

3) 200%

4) 250%

Q 18. The roots of the equation $x^2 - 6x + k = 0$ are p and q such that p > q and the difference of squares of the roots is 24, then find the value of 2k.

Q 19. From a vessel completely filled up with pure milk, 140 liters is removed and replaced with equal quantity of water. The process is repeated one more time. In a 98 liters sample of the resulting solution 80 liters is water. Find the capacity of the vessel (in liters).

Q 20. The ratio of compound interest and simple interest on a certain sum is 11 : 10 after two years. What is the common rate of interest (in percentage) per year?

Q 21. There are 2n integers [0, 0, 1, 1, 2, 2 ,..., (n – 1), (n – 1)]. From these 2n integers, n integers are chosen such that their average is an integer. Find the minimum average of those chosen n integers, given that n = 19.

1) 4

2) 5

3) 6

4) 7

Q 22. Murphy had Rs. 62 with which he could buy 5 apples, 6 bananas and 7 oranges. Cost of 20 apples, 20 bananas and 20 oranges together are Rs. 220. If he wanted to buy 7 apples, 6 bananas and 5 oranges. How much more money (in Rs.) will he require?
