Prime CAT 12 2022 QA

Q 1. In a basket there are a certain number of mangoes and kiwis that costs Rs. 336. If 1 kiwi is added to the basket, the average cost per fruit in the basket increases by Rs. 2 and if 1 mango is added to the basket, the average cost per fruit in the basket decreases by Re. 1. It is also known that if 2 kiwis are replaced with 2 mangoes, the average cost per fruit in the basket becomes Rs. 9. Find the total number of fruits in the basket initially.

Q 2. If $a_0 = 2$, $a_1 = 1$ and $a_{n+1} \times a_{n-1} = a_{n-1} - a_{n+1}$, then the value of a_{1001}/a_{1000} is greater than

1) a_1

2) a_{1000}/a_{999}

3) a_{1002}/a_{1001}

4) 1004/1005

Q 3. In a quadrilateral ABCD, E is a point on AB. If $\angle ADE = \angle DEC = \angle ECB = 30°$, AD = 2 units and BC = 4 units. If AD and BC are extended to meet at a point F, then what is the area (in sq. units) of the quadrilateral DECF?

Q 4. A function f is defined such that f(1) = 2, f(2) = 5, and f(n) = f(n – 1) – f(n – 2) for all integer values of n > 2. What is the value of f(100)?

Q 5. A shopkeeper buys 50 kg of apples for Rs.6,000. He marks up the price of the apples such that even after giving a discount of 10%, he will still earn a profit of 12.5%. Later he decides to donate 10% of his apples to an orphanage. He increases his marked price and offers a discount of 6.25% on his remaining apples such that he still earns the same profit. What percentage above the cost price is his new marked price?

1) 37.5%

2) 28.5%

3) 33.33%

4) 16.67%

Q 6. Preet went to a shop to buy a certain number of pencils and erasers. Preet calculated the amount payable to the shopkeeper and offered that amount to him. Preet was surprised when the shopkeeper returned him Rs. 12 as balance. When he came back home, he realized that the shopkeeper had actually transposed the number of pencils with the number of erasers. Which of the following can be a VALID statement?

1) The number of erasers that Preet wanted to buy was 4 less than the number of pencils.

2) The number of pencils that Preet wanted to buy was 4 more than the number of erasers.

3) A pencil costs Rs. 3 more than that of an eraser.

4) All are valid statements.

Q 7. For how many integral values of p, both the roots of the equation $2x^2 + (4p - 1)x + 2p^2 - 1 = 0$ are real, negative and unequal?

Q 8. ABCD is a square of side 1 unit. P is a point on AB such that AP : PB = 1 : 3. If PC and BD intersect at a point X inside the square, then find the length of line segment CX.

1) 3/5 units

2) 4/7 units

3) 5/7 units

4) 7/9 units

Q 9. If (481)x – (bbb)y = 2629, where 'bbb' is a three-digit number and x and y are integers, then find the total number of solutions (x, y) that satisfy the equation.

Q 10. In the history exam, a candidate is required to answer 6 questions out of 10. The questions are divided into two groups - Indian History and World History - such that there are 5 questions in each group. The candidate has to attempt at least 2 questions from each group. In how many ways can he answer the questions?

Q 11. During Diwali, a clothing store manager offers discounts on a combination of two items, shirt and trousers, which are on sale. He has two schemes, such that the effective amount paid is the same in both schemes.
Scheme 1: On the purchase of a shirt P, 12.5% discount is given on the trousers, if purchased.
Scheme 2: On the purchase of the trousers, 10% discount is given on the shirt, if purchased.
After few days he decided to give a discount of 18% instead of 12.5% on the trousers in scheme 1.
What should be the discount offered on the shirt in scheme 2 such that customers still pay the same amount irrespective of the scheme chosen?

1) 20%

2) 14.4%

3) 16%

4) 15.6%

Q 12. If S is the set of all four-digit numbers that can be formed using the digits 1, 2, 4, 5, 7 and 8 such that each number is divisible by 5 as well as 9 where repetition of digits is not allowed, then what is the sum of all elements of set S?

1) 48000

2) 54000

3) 72000

4) 57780

Q 13. If $N = (\log_2 x)^2 - 6(\log_2 x) + 12$, then the number of distinct values of x for $x^N = 256$ is

1) 1

2) 2

3) 3

4) More than 3

Q 14. A milk vendor has 2 vessels each having a capacity of 120 liters. The first vessel contains 35% water and the rest is pure milk. The second vessel contains 75% pure milk and the rest is water. How much quantity of milk solution should the milk vendor mix from the first and the second vessels respectively such that he gets 170 liters of milk solution having the ratio of water to milk as 7 : 18?

1) 80 liters, 90 liters

2) 72 liters, 98 liters

3) 55 liters, 115 liters

4) 51 liters, 119 liters

Q 15. A sheet in the form of a square of side 10 cm is cut only once along a diagonal and the two triangles are placed side by side without overlap to form an isosceles triangle. What is the ratio of the perimeter of the square to the perimeter of the triangle?

1) $2 : (1 + \sqrt{2})$

2) $1 : (1 + \sqrt{2})$

3) $3 : \sqrt{2}$

4) $1 : (2 - \sqrt{2})$

Q 16. A group containing 2 men and 2 women can complete a piece of work in 30 days. Four men and nine women can complete the work in 10 days. In how many days will 10 men and 15 women complete the work?

Q 17. Find the total number of points having integral coordinates inside the region enclosed by $4|x| + 3|y| = 24$ in the X-Y plane.

1) 81

2) 93

3) 95

4) 85

Q 18. In a certain race, A beats B by 100 m or 10 seconds. B beats D by 30 seconds. If the speeds of A, B and C are in the ratio 5 : 4 : 2, by what distance (in meters) does D beat C in the same race?

Q 19. At a factory, ice cream is made from only two ingredients – fruit and cream. Fruit costs Rs.54 / kg, while cream costs Rs.44 / kg. The total amount spent on acquiring the two ingredients is Rs.608. If the amount of fruit as well as cream used are integral number of kilograms, what is the weight (in kg) of ice cream obtained?

1) 12

2) 14

3) 16

4) 15

Q 20. A point P is randomly chosen at a distance of 8 cm from the center of a circle. A chord AB is drawn passing through P. C is a point on the circumference of the circle such that AC = BC. If the radius of the circle is 17 cm, then which of the following cannot be a value of area (in sq. cm) of ΔABC?

1) 289

2) 135

3) 375

4) 255

Q 21. A is the set of first 50 natural numbers. B is a subset of A such that there exist at least 2 pairs of elements in B whose difference is 15. If 'n' is the number of elements in B, then find the maximum value of 'n' such that B contains minimum number of pairs whose difference is 15.

1) 15

2) 30

3) 32

4) 31

Q 22. Kulbhushan deposited an equal amount of money in two schemes - A and B. Both schemes offer r% interest per annum, but scheme A calculates Simple Interest and Scheme B calculates Compound Interest. The interest earned in the third year and fourth year from Scheme B was Rs.49,650 and Rs.54,615 respectively. Find the total interest (in Rs.) earned from Schemes A at the end of the fifth year.

1) 65,000

2) 80,000

3) 75,000

4) 90,000
