Prime CAT 14 2022 QA

Q 1. Rajiv can do a piece of work in 15 days working 8 hours per day. If Sanjiv works with three-fifth of the efficiency with which his friend Rajiv works, then in how many days can Sanjiv do the same piece of work, working 10 hours per day?

Q 2. If the sum of two distinct natural numbers is 60, then what is the maximum possible HCF of these 2 numbers?

1) 30

2) 20

3) 15

4) 24

Q 3. In a box, there are only four types of toffees, namely Coffy Bite, Pulse, Mango Bite and Pan Pasand. There are 25% more toffees of Coffy Bite than Mango Bite, 10% fewer toffees of Pulse than Coffy Bite, and 10% of the toffees are of Pan Pasand. If there are 90 toffees of Pulse, then how many toffees are there in the box?

Q 4. Let for all real values of x, $f(2x) = 4f(x) + 6$, $f(x + 2) = f(x) + 12x + 12$ and $f(1) = 1$. What is the value of $f(42)$?

1) 5290

2) 6468

3) 4240

4) 4678

Q 5. Find the area (in sq. cm) of a quadrilateral which is formed by joining the mid points of a rectangle of length 12 cm and breadth 8 cm.

Q 6. Rohit has three types of boxes large, medium and small. He plays a game in which he placed 5 large boxes on the table. He puts 3 medium boxes each, in few of the large boxes then he puts 3 small boxes each, in few of the medium boxes. If the number of boxes that have been left empty in the game is 21, then how many boxes were used in the game by Rohit?

1) 23

2) 29

3) 35

4) 39

Q 7. In a shop sanitizer is available only in sealed bottles of volume 1 liter. The alcohol concentration in the mentioned sanitizer is one or the other of three concentrations 20%, 30% and 50%. The cost per 1 liter of the sanitizer having alcohol concentration 20%, 30% and 50% is Rs.30, Rs.40 and Rs.60 respectively. Aman wants to prepare a solution of 10 liters of sanitizer having alcohol concentration 40% using the bottles of sanitizer available in the shop. What is amount (in Rs.) Aman must spend in buying the bottles of sanitizer?

1) 360

2) 400

3) 500

4) 420

Q 8. The number of factors of the number $K = 8^6 + 6^8$ is

1) 72

2) 36

3) 18

4) 144

Q 9. A triangular field has to be fenced with a barbed wire. The cost incurred on fencing the triangular field is Rs.20 per meter of barbed wire used. If the sum of length of any two sides of the triangular field is 28 meters and 3 lengths of wire are used along each side, then which of the following cannot be the total cost (in Rs.) incurred on fencing the triangular field with the barbed wire?

1) 1,800

2) 2,100

3) 2,520

4) 3,360

Q 10. Find the maximum value of $|x - y|$ among all integral solutions (x, y) for $x(2x^2 + y) = 7$.

Q 11. My current age is 7 years more than five times the age of one of my two daughters named Anu. After N years, I will be 7 years more than five times the age of my other daughter named Sonu. What is the minimum possible integral difference (in years) between the ages of my two daughters? (N is a natural number.)

1) 5

2) 6

3) 4

4) 2

Q 12. There are five friends A, B, C, D and E. The weights of A, B and C are 92%, 111% and 93% respectively of the average weight of all five. The ratio of the weights of D and E is 7 : 10. The difference between the weights of D and E is 18 kg. What is the average weight (in kg) of B and C?

Q 13. A trapezium ABCD is inscribed in a circle with center O. AB is parallel to CD and the tangent at the point C intersects the line AB produced at E. If BE = 4 units, CE = 6 units and ΔBCE is an isosceles triangle where BC = CE, then what is the area (in sq. units) of the trapezium ABCD?

1) 32

2) $56\sqrt{2}$

3) $28\sqrt{2}$

4) 24

Q 14. Copper and Tin are the only elements in the alloys A and B. The ratio of copper and tin in the alloys A and B is 3 : 5 and 4 : 1 respectively. An alloy C is made by mixing alloys A and B. Which of the following can be a possible ratio of tin and copper in the alloy C?

1) 7 : 35

2) 11 : 5

3) 12 : 7

4) 6 : 5

Q 15.

If $2^{\log_{256}(9-7x)^8} \geq (x-4)^2$, then the number of integral values of 'x' that satisfy the given inequality is

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Q 16. A man invested Rs.20,000 at a rate of 7.5% per annum at simple interest. He withdraws the final amount after 'T' years. He keeps half of the withdrawn amount with him and invests the remaining. This invested amount kept on reducing at a simple rate of 25% per annum for a period of 3 years. If the aggregate sum with the man after 'T + 3' years is Rs.20,000, then find the value of 'T' (in years).

1) 10

2) 8

3) 12

4) 6

Q 17. The coefficients a, b and c in the quadratic equation $ax^2 + bx + c = 0$, are three consecutive terms of a geometric progression in that order. If $c = 2(5b - 12a)$, then which of the following can be the product of the roots of this equation?

1) 15

2) 25

3) 36

4) 24

Q 18. How many four-digit numbers with distinct digits among 1 to 9 are there such that the sum of the digits is even?

1) 2374

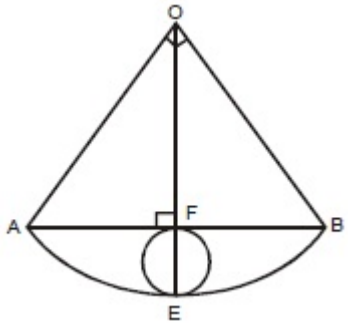
2) 2256

3) 1656

4) 1584

Q 19. If $S_n = 2 - 4 + 6 - 8 + 10 - 12 + \ldots$ up to 'n' terms, then what is the value of $S_{101} - S_{102} + S_{103}$?

Q 20. In the figure given below AOB is a quadrant of a circle having radius 4 cm. Find the radius (in cm) of the smaller circle with diameter FE.



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

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

3) $(2 - \sqrt{2})$

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

Q 21. If $z = (x - 5)(x - 3) \neq 0$ and $y = 4^x + 4^{1-x}$, where x, y, z are all real numbers, then what is the maximum value of 1/(yz)?

1) 1/5

2) 1/15

3) 1

4) 1/40

Q 22. Train X and train Y travel at 54 km/h and 60 km/h respectively. The time taken by train X to completely cross a tree is 24 seconds. The time taken by train X and train Y to completely cross a railway platform is 90 seconds and 72 seconds respectively. What is the length (in meter) of train Y?