

Prime CAT 05 2022 QA

Q 1. If $(5x + 6y - 39)^2 + (4x - 5y + 8)^2 = 0$ and $3x - 4y = -7$, then the value of $x + y$ is

Q 2. In a survey of 500 people, 20% do not like Tea, Coffee or Milk. 10% like all the three. There are 20% who like Tea and Coffee, 18% who like Coffee and Milk and 18% who like Tea and Milk. If the ratio of the number of people that like only Tea, only Coffee and only Milk is 8 : 5 : 9, then what is the ratio of the number of people who like only Milk to the number of people who like either Tea or Coffee or both but not Milk?

- 1) 1 : 2
- 2) 2 : 3
- 3) 1 : 3
- 4) 4 : 9

Q 3. Rekha bought two types of muffins – A and B in x and y quantity worth Rs. 1,000 for her daughter's birthday party such that each muffin costs Rs. 5 and Rs. 7 respectively. x and y are as close as possible. On her next birthday, Rekha buys muffins – A and B in y and x quantity respectively. How much (in Rs.) more/less did Rekha pay?

Q 4. Nita purchases three dresses from a shop. She got one of them altered for Rs.60 and she paid a total of Rs.2,280. The shopkeeper made an overall profit of 11% on the cost price of all the three items together. The average cost price of the other two items is Rs.400. The altered dress was sold at a profit of 20% after a discount of 10%. What was the marked price of the altered dress?

- 1) Rs.1,440
- 2) Rs.1,540
- 3) Rs.1,780
- 4) Rs.1,600

Q 5. A rectangle ABCD inscribed in a semicircle with diameter PQ such that points A and B are on diameter PQ. If $AB = 8$ cm and $PA = QB = 4$ cm, then the area (in sq. cm) of rectangle ABCD is

- 1) $16\sqrt{3}$
- 2) $32\sqrt{3}$
- 3) $24\sqrt{3}$
- 4) $64\sqrt{3}$

Q 6. Let $|x| \leq \sqrt{25 - x^2}$ and $x^2 = |a|$, then the equations are true for what percentage of the interval $[-20, 20]$ for value 'a'?

- 1) 50%
- 2) 62.5%
- 3) 66.67%
- 4) 4.75%

Q 7. Jiya went shopping for her birthday at the mall, where she purchased a dress for 28% of the money that was there in her wallet. Out of the remaining money Jiya spent 25% to pay for a pair of shoes, which was worth Rs.1,728. Then Jiya spent 12.5% of the remaining money on the purchase of some jewelry. After that she lost her wallet. Find the amount that Jiya lost.

- 1) Rs.5,184
- 2) Rs.3,546
- 3) Rs.4,536
- 4) Rs.2,592

Q 8. Two congruent circles intersect at points A and B, and each circle passes through the center of the other circle. The line containing both the centers is extended to intersect the circles at points C and D. If the radius of the circles is 4 cm, then what is the length of AD (in cm)?

- 1) $4\sqrt{3}$
- 2) $8\sqrt{2}$
- 3) $8\sqrt{3}$
- 4) $4\sqrt{2}$

Q 9. For positive integers m, n and x, $x^m + x^n = 1040$ and $n^2(m^n - n) = 675$, then what is the value of $m^x + n^x$?

Q 10. There are two containers A and B containing a mixture of milk and water. The concentration of milk in container A and B is $(x - 6)\%$ and $(x + 11)\%$ respectively. If both mixtures are mixed together in a certain ratio to get 102 liters of mixture in which the concentration of milk is $(x + 3)\%$, find the amount (in liters) of mixture used from container A.

Q 11. Amit travels from Agra to Lucknow in 4.8 hours with the same distance at 3 different speeds of 60 km/h, 75 km/h and 100 km/h. The respective mileage per liter of fuel for the above speeds is 16 km, 20 km, 24 km. Since petrol is so expensive; he wants to minimise his car's fuel consumption on the return journey. If he cannot drive his car more than 100 km/h and the price of petrol is Rs. 102 per liter, then how much cost (in Rs.) will he be able to save?

- 1) 51
 - 2) 255
 - 3) 459
 - 4) 357
-

Q 12. What is the minimum value of $17 \log_{30} x - 3 \log_x 5 - 3 \log_x 6 + 20 \log_x 10 + 20 \log_x 3$ if $x > 1$?

- 1) 17
 - 2) 28
 - 3) 34
 - 4) 1
-

Q 13. Surjit lends Rs. 20,000 to two of his friends - Amit and Vinit for two years. He gives Rs.10,000 to Amit at 10% per annum compound interest. Surjit wants to make a profit of 30% on the whole. The simple interest rate at which he should lend the remaining sum of money to Vinit is

- 1) 13.5%
 - 2) 19.5%
 - 3) 16.5%
 - 4) 18.5%
-

Q 14. In a written test of Mathematics, the score of C was one-thirteenth of the sum of the scores of A and B. After an oral test, each of them's scores increased by 4. If the final scores of A, B and C were in the ratio 9 : 8 : 3, then the final score of B was how much less than the sum of the final scores of A and C?

Q 15. For all natural numbers x , $f(1) + f(2) + f(3) + \dots + f(x) = x^3 f(x)$ and $f(8) = 91$, then which of the following numbers is the least possible factor of $f(8) - f(9)$?

- 1) 2
 - 2) 3
 - 3) 5
 - 4) A number greater than 5
-

Q 16. A fruit vendor purchased a box containing 180 mangoes. During transportation 30% of them got damaged. The good mangoes were sold at 20% profit whereas 50% of the damaged mangoes were sold at 10% loss and the remaining at 15% loss. If the total selling price of the box of mangoes was Rs.3,969, then what was the cost (in Rs.) of a dozen mangoes?

Q 17. Let the $(q - 2)$ th and $(p + 1)$ th terms of a geometric progression be $\frac{4}{3}$ and 108 respectively, where $p > q$. If the common ratio of the GP is an integer r , then what is the largest possible value of $r/(p - q)$?

- 1) -9
- 2) -3
- 3) 3
- 4) 9

Q 18. The ratio of the speeds of Trains A and B is 3 : 5. Both start from station X at the same time and reach station Y, which is 125 km away at the same time. Train B has two stoppages of 15 minutes each in between. If the length of train B is 500 meter, then find the time taken (in seconds) by it to cross a bridge of length 2 km.

- 1) 36
- 2) 54
- 3) 48
- 4) 72

Q 19. In triangle ABC, a point D is on BC such that $BD = 1$ cm and $DC = 3$ cm. Point E is on AC such that DE is parallel to AB and point F is on AB such that DF is parallel to AC. If the area of the parallelogram AFDE is 51 sq. cm, then what is the area (in sq. cm) of the triangle ABC?

Q 20. Anu and Binu are running on the boundary on two concentric circular tracks with radii in the ratio 3 : 4. The ratio of the speeds of Anu and Binu is 9 : 10. Anu is running on the inner track and Binu is running on the outer track. Their starting points form a right angle at the center. Both start running in the same direction and after 10 seconds Binu covers a quarter of the outer track. After how much time will the distance between Anu and Binu be minimum?

- 1) 3 minutes
 - 2) 2 minutes
 - 3) 2.5 minutes
 - 4) 4.5 minutes
-

Q 21. In a bag, the ratio of number of pens, pencils and erasers is 2 : 3 : 7. A few erasers are taken out and a few pens and pencils are put into the bag such that the ratio now becomes 4 : 5 : 9. What could be the minimum possible number of pencils that were put into the bag?

Q 22. A group of employees working together at the same rate can complete a project in 45 hours. When the work started, all employees did not start working together. They joined the work over a period of time, one by one, at equal intervals. Once at work, each one stayed till the work was complete. If the first employee worked 5 times as many hours as the last employee, for how many hours did the first employee work?

- 1) 60
 - 2) 75
 - 3) 81
 - 4) 90
-