Prime CAT 09 2022 QA

Q 1. If r is a constant such that $|x^2 - 8x + r| = 1$ has only one distinct real root, then the possible integral value of r is

1) 15

2) 16

3) 17

4) 18

Q 2. Class A has 6 less students than class B. The sum of total marks obtained by class A students were 288 and that of class B were 396 in the same test. If the average marks obtained by class A students were 2 more than the average marks obtained by class B students, then the sum total number of students of class A and class B are

1) 28

2) 30

3) 45

4) 48

Q 3. If $\log(1 + x) + \log(1 + x^2) + \log(1 + x^4) = 1 + \log(x - x^9) - \log(1 - x)$, then 100x equals

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Q 4. Two persons A and B buy two articles for Rs.500 and Rs.1,000 respectively. A marks his article up by P%, while B marks his article up by 2P% and allows a discount of P%. If both make the equal non-zero profit, then the sum of their profits (in Rs.) is

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Q 5. Abhilash, Avinash and Akhilesh can complete a work alone in 20 days, 12 days and 30 days, respectively. Abhilash only works alternate days starting from the first day. Akhilesh only works on alternate days starting from second day. Avinash works every day. Then, the number of days taken to complete the work is

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Q 6. The number of kilometers covered by comet A and comet B together in a day is what comet C alone covers in 11 days. The number of kilometers covered by comet A and comet C together is what comet B alone covers in 7 days. The ratio of the daily kilometers covered by the comet who covers the most kilometers to the comet who covers the least kilometers is

1) 19 : 2

2) 2 : 19

3) 3 : 2

4) 19 : 3

Q 7. How many 3 digit numbers between 257 and 762 increase by 495 when the three digits are arranged in reverse order?

Q 8. Two containers – A and B – are filled with the milk solution of strengths 40% and 50% respectively. The volumes of the containers A and B are 600 cc and 750 cc respectively. A part of the solution from the container A is thrown away and replaced by equal volume of the solution from container B. If the concentration of the milk solution in container A is 44%, then the solution left in the container B is

1) 240 ml

2) 360 ml

3) 490 ml

4) 510 ml

Q 9. If $|x - 10| < 20$ and $|y - 10| < 40$, then the number of integral values $|x + y|$ can take is

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Q 10. A shopkeeper is just able to pay rent of his shop if he sells a certain number of items at an average profit of Rs. 80 per item or if he sells 50 more items at an average profit of Rs. 60 per item. The rent of his shop, in Rs., is

1) 10,000

2) 12,000

3) 15,000

4) 9,000

Q 11. Let a square S be inscribed in a circle C1 and another circle C2 inscribed in square S. Then, the area of circle C1 is how many times the area of circle C2?

Q 12. There are 4 gift hampers 1, 2, 3 and 4 such that all of them cost an equal amount. If gift 1 contains 4 cups, 2 spoons and 15 plates, gift 2 contains 3 cups, 6 spoons and 15 plates, and gift 3 contains 1 cup, 2 spoons and 16 plates, which of the following can be the contents of gift 4?

1) 15 cups, 7 spoons and 10 plates

2) 45 cups

3) 10 cups, 14 spoons and 12 plates

4) 8 spoon and 16 plates

Q 13. Two trains cross each other in 5 seconds when moving in the opposite direction along parallel tracks and in 15 seconds when travelling in the same direction along parallel tracks. If the speed of the faster train is 40 km/h more than the speed of the slower train, then the speed of the slower train, in km/h, is

1) 36

2) 40

3) 80

4) 50

Q 14. A circle of diameter 4 cm is inscribed inside a triangle ABC of perimeter 24 cm where $\angle ABC = 90°$. The area of the triangle ABC (in cm^2) is

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Q 15. Zubin invests equal amount of money at the same fixed rate of annual interest under simple interest as well as under compound interest. If the simple interest accrued at the end of the third year is Rs.1,200 and the compound interest accrued at the end of the third year is Rs.1,324, then the rate of interest per annum is

1) 8%

2) 10%

3) 12%

4) 20%

Q 16. Gabbar and Sambha can finish some work in 20 days, Sambha and Kalia can finish the same work in 35 days and Gabbar, Sambha and Kalia can together finish the same work in 14 days, then Sambha alone will take how many days to finish the same work?

Q 17. If $x_1 = 1.385$ and $x_n = x_{n-1} \times (-1)^{n-1}$, n = 2, 3, 4, …. , then x_{2000} is equal to

1) 1.385

2) −1.385

3) 0.385

4) −2.385

Q 18. A man jogs at speeds of 1 kmph, 2 kmph, 2 kmph, 3 kmph, 6 kmph, 6 kmph and 12 kmph for seven consecutive days, respectively. The duration for which he jogs for the first three days is one third the durations for which he jogs for the next 3 days. The duration for which he jogs on the last day is twice the duration for which he jogs on the first day. His average speed (in kmph) for the entire week is the integer closest to _____.

1) 6

2) 4

3) 5

4) 16

Q 19. In how many ways can an experiment with more than two elements be performed using Sodium, Calcium, Helium, Neon, Argon, Krypton, Xenon and Radon such that Krypton is always chosen while any two of Sodium, Helium and Xenon are never together?

1) 44

2) 56

3) 93

4) 105

Q 20.

If $f(x) = x^2 + 8x + 12$ and $g(x) = x^2 + 2x - 24$, then $\frac{f(x)}{g(x)}$ is non negative if and only if

1) $-\infty < x \leq -2$ or $4 \leq x < \infty$

2) $-\infty < x < -6$ or $-6 < x \leq -2$ or $4 \leq x < \infty$

3) $-\infty < x \leq -2$ or $4 < x < \infty$

4) $-\infty < x < -6$ or $-6 < x \leq -2$ or $4 < x < \infty$

Q 21. A right angled triangle ABC is right angled at B and ∠BCA = 5∠BAC. D is a point on AB such that D is twice the distance from C than its shortest distance from the side AC. What is the measure of the ∠ADC (in degrees)?

1) 105

2) 120

3) 135

4) 75

Q 22. The perfect squares are divided into groups as (1), (4, 9, 16, 25), (36, 49, 64, 81, 100, 121, 144, 169, 196) … and so on. Then the sixth perfect square in the eleventh group is

1) 152881

2) 36100

3) 152100

4) 153664
