Prime CAT 11 2022 QA

Q 1. Joshna and Neeraj run around a quadrant shaped track of radius 56 m in the same direction. The speeds of Joshna and Neeraj are 5 m/s and 1 m/s respectively. If they start from the same point and at the same time, then find the shortest distance (in meters) on the track from the starting point when they meet for the 5th time. (Given π = 22/7)

1) 88

2) 100

3) 40

4) 50

Q 2. If $|x + 17| + |x - 18| - |x + 19| \leq 100$, how many integer values can 'x' take?

1) 120

2) 201

3) 121

4) 200

Q 3. Renu had a bag with balls in three colours – Yellow, White and Black, in the ratio 5 : 4 : 6 respectively. Renu lost 'x' Yellow balls and because of this the percentage of Yellow balls in the bag reduced to 20% and the percentage of White balls increased by 't' percentage points. After a while, Renu lost '2x' Black balls and because of this the percentage of White balls in the bag increased by 'p' percentage points over its percentage after the first time Renu lost the balls. Find the value of (p – t).

Q 4. Two vessels I and II contain mixture of Soda, Mango juice and Honey in the ratio of 13 : 12 : 9 and 7 : 4 : 3 respectively. If mixtures from both vessels are mixed respectively in the ratio of 17 : 14 into another vessel III, then the total quantity of mango juice in vessel III will be 30 litres. Find the difference between the quantity (in litres) of Soda and Honey in vessel III.

Q 5. If a shopkeeper had bought an item at 20% less than usual cost price and sold it at 20% more than usual selling price, his profit percentage would have been three times the usual profit percentage. What is his usual profit percentage?

1) 25%

2) 40%

3) 33.33%

4) 20%

Q 6. Let $f(x) = (x - 2)(x - 1)(x + 3)(x + 5)$, then which of the following is true regarding the number of integral roots of $f(x) > 0$ and $f(x) < 0$ respectively?

1) Finitely many, Infinitely many

2) Infinitely many, Exactly 1

3) Infinitely many, Infinitely many

4) Finitely many, Exactly 1

Q 7. In a parallelogram ABCD, points F and E are on AD and DC respectively. Point F divides AD in the ratio 2 : 1 and point E divides CD in the ratio 1 : 3. If area of triangle DFE is 120 sq. units, then find the area (in sq. units) of triangle BFE.

1) 480

2) 400

3) 450

4) 500

Q 8. A work was started by one of the workers of a group that consists of 12 equally efficient workers. The pth worker (where $2 \le p \le 12$) joined the work $(p - 1)x$ days after the $(p - 1)$th worker joined. The work was completed in $12x$ days after the 12th worker joined. The 1st worker received Rs. 28,500 out of the total wages paid to the group for completing the work. Find the total wages (in Rs.) for completing the work.

Q 9. If $\log_a 36 = 1.44$, and $\log_2 a = 3.2$, then find the value of $\log_2 32a + \log_a 144$.

1) 9.64

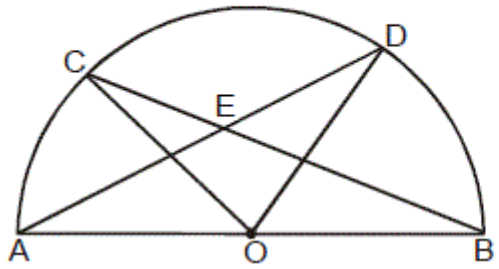
2) 10.265

3) 10.015

4) 9.9525

Q 10.

In the diagram given below, AB is a diameter of the circle of center O. If $\angle COD$ is 80°, then the value of $\angle CED$ (in degrees) is



Q 11. At 6:00 PM, Abhishek begins writing down natural numbers, starting from 1, in a row from left to right, on a board whereas Ruchika starts to erase these digits at 6:15 PM. Abhishek writes at the rate of 40 digits per minute and Ruchika erases at the rate of 60 digits per minute. What will be the last digit that is written down by Abhishek and erased by Ruchika simultaneously?

Q 12. A train starts from a station A and travels to another station B. There is a tunnel PQ of fixed length between A and B. A tiger is at point M in the tunnel such that PM : MQ = 1 : 2. When the train starts from A, if the tiger starts running towards P, he will meet the train at P. But if he starts running towards Q, the train will meet the tiger at Q. The ratio of the speed of the train to the speed of the tiger is

1) 3 : 1

2) 2 : 1

3) 4 : 1

4) 5 : 2

Q 13. A group has 268 persons out of which 148 can speak Hindi, 127 can speak English, and 136 can speak Bengali. Also, 64 persons can speak both Hindi and English, 29 can speak both Bengali and English, while 68 can speak both Hindi and Bengali. If every person can speak at least one language, then what is the number of persons who can speak only Hindi?

1) 23

2) 34

3) 29

4) 36

Q 14. What is the sum of all possible values of x that satisfy the equation $x|x| - 10x - 24 = 0$?

Q 15. PQRS is a square of area 24 sq. cm. T and V are the midpoints of PQ and RS, respectively. X and Y are points on the line joining T and V such that $\angle PXQ = \angle RYS = 120°$. Find the area (in sq. cm) of the hexagon PXQRYS.

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

2) $2(6 - 2\sqrt{3})$

3) $12(2 + \sqrt{3})$

4) $4(6 - \sqrt{3})$

Q 16. Let $a_{n+1} = 1 + a_n \times a_{n-1} \times \ldots \times a_1$, for all $n \geq 1$. If $a_5 = 43$, find the number of factors of a_6.

1) 2

2) 4

3) 8

4) 10

Q 17. Three friends Paras, Rajat, and Sanjay can paint a wall individually in 180 minutes, 150 minutes and 60 minutes respectively. The three of them started painting the wall at 12 noon. At 12:20 PM Sanjay left and after another half an hour Rajat also left, leaving Paras alone to do the remaining work. At what time did Paras finish the job?

1) 1:05 PM

2) 1:08 PM

3) 12:55 PM

4) 1:00 PM

Q 18. Kishan is a business man who goes on offshore visits. The number of offshore visits made by Kishan in 2014 was 5 and it kept increasing at a rate of 100% for next four years over the previous year due to a drastic increase in his business. What is the total number of offshore visits made by Kishan from 2014 to 2018?

1) 150

2) 160

3) 170

4) 155

Q 19. If $A = 5! + 10! + 15! + \ldots + 50!$ and $B = 2^2 \times 3^2 \times 5^2$, then find the remainder when A is divided by B.

Q 20. Mr. Gupta invested one half of his savings in an Insurance Policy that paid simple interest for 2 years and received Rs.18,000 as interest. He invested the remaining in a Mutual fund that paid compound interest, calculated annually, for 2 years at the same rate of interest and received Rs.19,350 as interest. What amount (in Rs.) of his savings did he invest in the Insurance Policy?

1) 1,20,000

2) 45,000

3) 60,000

4) 50,000

Q 21. In triangle ABC, D is a point on AC between points A and C. If area of triangle DBC = 25 sq. units, ∠BAC = ∠DBC and AC : BC = 7 : 5, then what is the area (in sq. units) of triangle ADB?

Q 22. If $f(x) = px^2 - qx + 4$ is a quadratic function and the roots of $f(x) = 0$ are the reciprocals of the roots of another quadratic equation $g(x) = 0$, then what is the quadratic function $g(x)$?

1) $4x^2 + qx - p$

2) $4x^2 - qx - p$

3) $4x^2 - qx + p$

4) $4x^2 + qx + p$
