

CAT 2015 based paper

Section 3 Quant

1. A person who has a certain amount with him goes to market. He can buy 50 oranges or 40 mangoes. He retains 10% of the amount for taxi fares and buys 20 mangoes and of the balance he purchases oranges. Number of oranges he can purchase is
- 36
 - 40
 - 15
 - 20

2. $\frac{2}{5}$ of the voters promise to vote for P and the rest promised to vote for Q. Of these, on the last day 15% of the voters went back of their promise to vote for P and 25% of voters went back of their promise to vote for Q, and P lost by 2 votes. Then the total number of voters is

Type in the answer here: _____

3. A stockist wants to make some profit by selling sugar. He contemplates about various methods . Which of the following would maximise his profit?

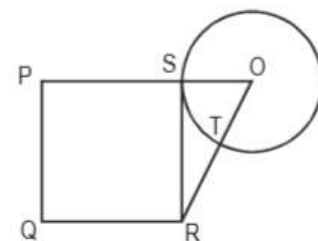
- Sell sugar at 10% profit.
 - Use 900 g of weight instead of 1 kg.
 - Mix 10% impurities in sugar and selling sugar at cost price.
 - Increase the price by 5% and reduce weights by 5%.
- I or III
 - II
 - II, III and IV
 - Profits are same

4. For the product $n(n + 1)(2n + 1)$, $n \in \mathbb{N}$, which one of the following is not necessarily true?

- It is even
- Divisible by 3
- Divisible by the sum of the square of first n natural numbers
- Never divisible by 237

5. ABCD is a square of area 4 with diagonals AC and BD, dividing square into 4 congruent triangles. Figure looks like four non-overlapping triangles. Then the sum of the perimeters of the triangles is

- $8(2 + \sqrt{2})$
- $8(1 + \sqrt{2})$
- $4(1 + \sqrt{2})$
- $4(2 + \sqrt{2})$



6. PQRS is a square. SR is a tangent (at point S) to the circle with centre O and $TR = OS$. Then the ratio of area of the circle to the area of the square is

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- a. $\pi/3$
- b. $11/7$
- c. $3/\pi$
- d. $7/11$

7. From a circular sheet of paper with a radius 20 cm, four circles of radius 5 cm each are cut out. What is the ratio of the uncut to the cut portion?

- a. 1 : 3
- b. 4 : 1
- c. 3 : 1
- d. 4 : 3

8. A wooden box (open at the top) of thickness 0.5 cm, length 21 cm, width 11 cm and height 6 cm is painted on the inside. The expenses of painting are Rs. 70. What is the rate of painting per square centimetres?

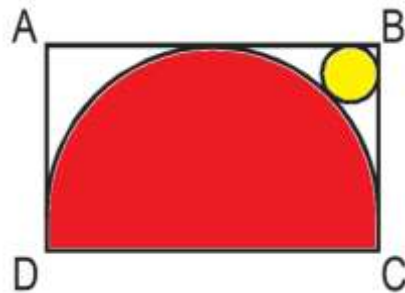
- a. Re 0.7
- b. Re 0.5
- c. Re 0.1
- d. Re 0.2

9. The cost of diamond varies directly as the square of its weight. Once, this diamond broke into four pieces with weights in the ratio 1 : 2 : 3 : 4. When the pieces were sold, the merchant got Rs. 70,000 less. Find the original price of the diamond.

Type in the answer here: _____

10.. The figure shows the rectangle ABCD with a semicircle and a circle inscribed inside in it as shown. What is the ratio of the area of the circle to that of the semicircle?

- a. $(\sqrt{2} - 1)^2 : 1$
- b. $2(\sqrt{2} - 1)^2 : 1$
- c. $(\sqrt{2} - 1)^2 : 2$
- d. None of these



11. In a mile race, Akshay can be given a start of 128 m by Bhairav. If Bhairav can give Chinmay a start of 4 m in a 100 m dash, then who out of Akshay and Chinmay will win a race of one and half miles, and what will be the final lead given by the winner to the loser? (One mile is 1,600 m.)

- a. Akshay, $1/12$ mile
- b. Chinmay, $1/32$ mile
- c. Akshay, $1/24$ mile
- d. Chinmay, $1/16$ mile

12. Two liquids A and B are in the ratio 5 : 1 in container 1 and 1 : 3 in container 2. In what ratio should the contents of the two containers be mixed so as to obtain a mixture of A and B in the ratio 1 : 1?

- a. 2 : 3
- b. 4 : 3

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- c. 3 : 2
- d. 3 : 4

13. If $x^2 + y^2 = 0.1$ and $|x - y| = 0.2$, then $|x| + |y|$ is equal to

- a. 0.3
- b. 0.4
- c. 0.2
- d. 0.6

14. ABCD is a rhombus with the diagonals AC and BD intersecting at the origin on the x-y plane. The equation of the straight line AD is $x + y = 1$. What is the equation of BC?

- a. $x + y = -1$
- b. $x - y = -1$
- c. $x + y = 1$
- d. None of these

15. The set of all positive integers is the union of two disjoint subsets: $\{f(1), f(2), \dots, f(n), \dots\}$ and $\{g(1), g(2), \dots, g(n), \dots\}$, where $f(1) < f(2) < \dots < f(n) < \dots$, and $g(1) < g(2) < \dots < g(n) < \dots$, and $g(n) = f(f(n)) + 1$ for all $n \geq 1$. What is the value of $g(1)$?

- a. 0
- b. 2
- c. 1
- d. Cannot be determined

16. For all non-negative integers x and y , $f(x, y)$ is defined as below.

$$f(0, y) = y + 1 \quad f(x + 1, 0) = f(x, 1) \quad f(x + 1, y + 1) = f(x, f(x + 1, y)).$$

Then what is the value of $f(1, 2)$?

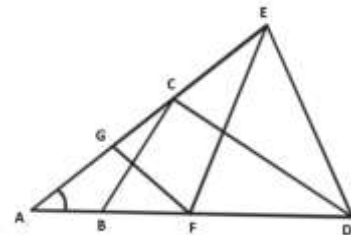
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17.

In the figure above, $AB = BC = CD = DE = EF = FG = GA$.

Then $\angle DAE$ is approximately

- a. 15°
- b. 20°
- c. 30°
- d. 25°



18. A water tank has three taps A, B, and C. A fills four buckets in 24 mins, B fills 8 buckets in 1 hour and C fills 2 buckets in 20 minutes. If all the taps are opened together a full tank is emptied in 2 hours. If a bucket can hold 5 litres of water, what is the capacity of the tank in litres?

Type in the answer here: _____

19. Shyam went from Delhi to Shimla via Chandigarh by car. The distance from Delhi to Chandigarh is $\frac{3}{4}$ times the distance from Chandigarh to Shimla. The average speed from Delhi to Chandigarh was half as much again as that from Chandigarh to Shimla. If the average speed for the entire journey was 49 kmph. What was the average speed from Chandigarh to Shimla?

- (a) 39.2 kmph

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- (b) 63 kmph
- (c) 42 kmph
- (d) None of these

20. Fourth term of an arithmetic progression is 8. What is the sum of the first 7 terms of the arithmetic progression?

- (a) 7
- (b) 64
- (c) 56
- (d) Cannot be determined

21. Two towns A and B are 100 km apart. A school is to be built for 100 students of town B and 30 students of Town A. Expenditure on transport is Rs. 1.20 per km per student. If the total expenditure on transport by all 130 students is to be as small as possible, then the school should be built at

- (a) 33 km from Town A.
- (b) 33 km from Town B
- (c) Town A
- (d) Town B

22. One man can do as much work in one day as a woman can do in 2 days. A child does one third the work in a day as a woman. If an estate-owner hires 39 pairs of hands, men, women and children in the ratio 6 : 5 : 2 and pays them in all Rs. 1113 at the end of the days work. What must the daily wages of a child be, if the wages are proportional to the amount of work done?

- (a) Rs.14
- (b) Rs.5
- (c) Rs.20
- (d) Rs.7

23. Let $u_{n+1} = 2u_n + 1$ ($n=0,1,2,..$) and $u_0 = 0$. Then u_{10} nearest to

Type in the answer here: _____

24. Let $x < 0.50$, $0 < y < 1$, $z > 1$. Given a set of numbers, the middle number, when they are arranged in ascending order, is called the median. So the median of the numbers x , y , and z would be

- (a) less than one
- (b) between 0 and 1
- (c) greater than 1
- (d) cannot say

25. The maximum possible value of $y = \min(1/2 - 3x^2/4, 5x^2/4)$ for the range $0 < x < 1$ is

- (a) $1/3$
- (b) $1/2$
- (c) $5/27$
- (d) $5/16$

26. Let $x < 0$, $0 < y < 1$, $z > 1$. Which of the following may be false?

- (a) $(x^2 - z^2)$ has to be positive.
- (b) yz can be less than one.
- (c) xy can never be zero.
- (d) $(y^2 - z^2)$ is always negative.

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27. A young girl counted in the following way on the fingers of her left hand. She started calling the thumb 1, the index finger 2, middle finger 3, ring finger 4, little finger 5, then reversed direction, calling the ring finger 6, middle finger 7, index finger 8, thumb 9, then back to the index finger for 10, middle finger for 11, and so on. She counted up to 1994. She ended on her.

- (a) thumb
- (b) index finger
- (c) middle finger
- (d) ring finger

28. Consider the set $S = \{1, 2, 3, \dots, 1000\}$. How many arithmetic progressions can be formed from the elements of S that start with 1 and end with 1000 and have at least 3 elements?

- (1) 3
- (2) 4
- (3) 6
- (4) 7

29. The number of solutions of the equation $2x + y = 40$ where both x and y are positive integers and $x \leq y$ is:

Type in the answer here: _____

30. If $\log_y x = (a \cdot \log_z y) = (b \cdot \log_x z) = ab$, then which of the following pairs of values for (a, b) is not possible?

- (1) $(-2, 1/2)$
- (2) $(1, 1)$
- (3) $(\pi, 1/\pi)$
- (4) $(2, 2)$

31. When you reverse the digits of the number 13, the number increases by 18. How many other two digit numbers increase by 18 when their digits are reversed?

Type in the answer here: _____

32. Survey was conducted of 100 people to find out whether they had read recent issues of Golmal, a monthly magazine. The summarized information regarding readership in 3 months is given below: Only September: 18; September but not August: 23; September and July: 8; September: 28; July: 48; July and August: 10; None of the three months: 24.

What is the number of surveyed people who have read exactly two consecutive issues (out of the three)?

- (1) 7
- (2) 9
- (3) 12
- (4) 14

33. Amol was asked to calculate the arithmetic mean of 10 positive integers, each of which had 2 digits. By mistake, he interchanged the 2 digits, say a and b , in one of these 10 integers. As a result, his answer for the arithmetic mean was 1.8 more than what it should have been. Then $b - a$ equals 1

Type in the answer here: _____

34. The angle of elevation of the top of a tower 30 m high, from two points on the level ground on its opposite sides are 45 degrees and 60 degrees. What is the distance between the two points?

- (1) 30
- (2) 51.96

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(3) 47.32

(4) 81.96