

**CAT 2020 – Slot 2 Paper (Memory Based)****Section 3 – Quantitative Aptitude**

Q.1) The sum of the perimeters of an equilateral triangle and a rectangle is 90cm. The area,  $T$ , of the triangle and the area,  $R$ , of the rectangle, both in sq cm, satisfy the relationship  $R = T^2$ . If the sides of the rectangle are in the ratio 1:3, then the length, in cm, of the longer side of the rectangle, is

1. 24
2. 27
3. 21
4. 18

Q.2) In May, John bought the same amount of rice and the same amount of wheat as he had bought in April, but spent ₹ 150 more due to the price increase of rice and wheat by 20% and 12%, respectively. If John had spent ₹ 450 on rice in April, then how much did he spend on wheat in May?

1. ₹ 580
2. ₹ 570
3. ₹ 560
4. ₹ 590

Q.3) In a car race, car A beats car B by 45 km, car B beats car C by 50 km, and car A beats car C by 90 km. The distance (in km) over which the race has been conducted is

1. 500
2. 475
3. 550
4. 450

Q.4) John takes twice as much time as Jack to finish a job. Jack and Jim together take one thirds of the time to finish the job than John takes working alone. Moreover, in order to finish the job, John takes three days more than that taken by the three of them working together. In how many days will Jim finish the job working alone?

Q.5) Let the  $m$ -th and  $n$ -th terms of a geometric progression be  $\frac{3}{4}$  and 12, respectively, where  $m < n$ . If the common ratio of the progression is an integer  $r$ , then the smallest possible value of  $r + n - m$  is

1. -2
2. 2
3. 6
4. -4

Q.6) If  $x$  and  $y$  are positive real numbers satisfying  $x+y=102$ , then the maximum possible value of  $2601\left(1 + \frac{1}{x}\right)\left(1 + \frac{1}{y}\right)$  is

Q.7) The value of  $\left(\frac{a}{b}\right) + \left(\frac{b}{a}\right)$ , for  $1 < a \leq b$  cannot be equal to

1. -0.5
2. 1
3. 0
4. -1

Q.8) In how many ways can a pair of integers  $(x,a)$  be chosen such that  $x^2 - 2|x| + |a - 2| = 0$ ?

1. 4
2. 5
3. 6
4. 7

Q.9) Students in a college have to choose at least two subjects from chemistry, mathematics and physics. The number of students choosing all three subjects is 18, choosing mathematics as one of their subjects is 23 and choosing physics as one of their subjects is 25. The smallest possible number of students who could choose chemistry as one of their subjects is

1. 20
2. 22
3. 19
4. 21

Q.10) For the real  $x$ , the maximum possible value of  $\frac{x}{\sqrt{1+x^4}}$  is

1.  $\frac{1}{\sqrt{3}}$
2. 1
3.  $\frac{1}{\sqrt{2}}$
4.  $\frac{1}{2}$

Q.11) Aron bought some pencils and sharpeners. Spending the same amount of money as Aron, Aditya bought twice as many pencils and 10 less sharpeners. If the cost of one sharpener is ₹ 2 more than the cost of a pencil, then the minimum possible number of pencils bought by Aron and Aditya together is

1. 30
2. 33
3. 27

4.36

Q.12) A sum of money is split among Amal, Sunil and Mita so that the ratio of the shares of Amal and Sunil is 3:2, while the ratio of the shares of Sunil and Mita is 4:5. If the difference between the largest and the smallest of these three shares is Rs 400, then Sunil's share, in rupees, is

Q.13) Anil buys 12 toys and labels each with the same selling price. He sells 8 toys initially at 20% discount on the labeled price. Then he sells the remaining 4 toys at an additional 25% discount on the discounted price. Thus, he gets a total of Rs 2112, and makes a 10% profit. With no discounts, his percentage of profit would have been

1. 60
2. 55
3. 50
4. 54

Q.14) Two circular tracks T1 and T2 of radii 100 m and 20 m, respectively touch at a point A. Starting from A at the same time, Ram and Rahim are walking on track T1 and track T2 at speeds 15 km/hr and 5 km/hr respectively. The number of full rounds that Ram will make before he meets Rahim again for the first time is

1. 4
2. 3
3. 2
4. 5

Q.15) How many 4-digit numbers, each greater than 1000 and each having all four digits distinct, are there with 7 coming before 3?

Q.16) The number of pairs of integers  $(x,y)$  satisfying  $x \geq y \geq -20$  and  $2x + 5y = 99$  is

Q.17) If  $x$  and  $y$  are non-negative integers such that  $x + 9 = z$ ,  $y + 1 = z$  and  $x + y < z + 5$ , then the maximum possible value of  $2x + y$  equals

Q.18) A and B are two points on a straight line. Ram runs from A to B while Rahim runs from B to A. After crossing each other, Ram and Rahim reach their destinations in one minute and four minutes, respectively. If they start at the same time, then the ratio of Ram's speed to Rahim's speed is

1. 2
2.  $\sqrt{2}$
3.  $2\sqrt{2}$
4.  $\frac{1}{2}$

Q.19) The distance from B to C is thrice that from A to B. Two trains travel from A to C via B. The speed of train 2 is double that of train 1 while traveling from A to B and their speeds are interchanged while traveling

from B to C. The ratio of the time taken by train 1 to that taken by train 2 in travelling from A to C is

1. 1: 4
2. 7: 5
3. 5: 7
4. 4: 1

Q.20) Let C be a circle of radius 5 meters having center at O. Let PQ be a chord of C that passes through points A and B where A is located 4 meters north of O and B is located 3 meters east of O. Then, the length of PQ, in meters, is nearest to

1. 7.2
2. 7.8
3. 6.6
4. 8.8

Q.21) The number of integers that satisfy the equality  $(x^2 - 5x + 7)^{x+1} = 1$  is

1. 2
2. 3
3. 5
4. 4

Q.22) Let  $f(x) = x^2 + ax + b$  and  $g(x) = f(x + 1) - f(x - 1)$ . If  $f(x) \geq 0$  for all real x, and  $g(20) = 72$ , then the smallest possible value of b is

1. 1
2. 16
3. 0
4. 4

Q.23) Let C1 and C2 be concentric circles such that the diameter of C1 is 2 cm longer than that of C2. If a chord of C1 has length 6 cm and is a tangent to C2, then the diameter, in cm, of C1 is

Q.24) From an interior point of an equilateral triangle, perpendiculars are drawn on all three sides. The sum of the lengths of the three perpendiculars is s. Then the area of the triangle is

1.  $\frac{\sqrt{3}s^2}{2}$
2.  $\frac{s^2}{\sqrt{3}}$
3.  $\frac{2s^2}{\sqrt{3}}$
4.  $\frac{s^2}{2\sqrt{3}}$

Q.25) For the same principal amount, the compound interest for two years at 5% per annum exceeds the

simple interest for three years at 3% per annum by Rs 1125. Then the principal amount in rupees is

Q.26) In a group of 10 students, the mean of the lowest 9 scores is 42 while the mean of the highest 9 scores is 47. For the entire group of 10 students, the maximum possible mean exceeds the minimum possible mean by

1. 4
2. 3
3. 5
4. 6

Answer Keys

Q.No.	Quant
1	2
2	3
3	4
4	4
5	1
6	2704
7	2
8	4
9	1
10	3
11	2
12	800
13	3
14	2
15	315
16	17
17	23
18	1
19	3
20	4
21	2
22	4
23	10
24	2
25	90000
26	1