CAT 2012 QA Slot 2 Question Paper

Time Allowed :3 Hours	**Maximum Marks :**300	**Total questions :**100

General Instructions

Read the following instructions very carefully and strictly follow them:

1. **Duration of Section:** 40 Minutes
2. **Total Number of Questions:** 22 Questions (as per latest pattern, may vary slightly)
3. **Section Covered:** Quantitative Aptitude (QA)
4. **Type of Questions:**
   - Multiple Choice Questions (MCQs)
   - Type In The Answer (TITA) Questions – No options given, answer to be typed in
5. **Marking Scheme:**
   - +3 marks for each correct answer
   - -1 mark for each incorrect MCQ
   - No negative marking for TITA questions
6. **Syllabus Coverage:** Arithmetic, Algebra, Geometry, Number System, Modern Math, and Mensuration
7. **Skills Tested:** Numerical ability, analytical thinking, and problem-solving

1. If the sum of two numbers is 15 and their product is 56, what is the sum of their reciprocals?

(1) $\frac{15}{56}$

(2) $\frac{56}{15}$

(3) $\frac{7}{8}$

(4) $\frac{8}{7}$

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2. A train travels 360 km at a uniform speed. If the speed is increased by 5 km/h, the journey takes 1 hour less. Find the original speed.

(1) 40 km/h

(2) 45 km/h

(3) 50 km/h

(4) 55 km/h

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3. What is the remainder when 7^{100} is divided by 8?

(1) 1

(2) 3

(3) 5

(4) 7

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4. A shopkeeper sells an item at a 20% discount but still makes a 20% profit. If the cost price is Rs. 100, what is the marked price?

(1) Rs. 120

(2) Rs. 125

(3) Rs. 150

(4) Rs. 160

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5. The roots of the quadratic equation $x^2 - 6x + k = 0$ are real and distinct. How many integer values of k are possible if k is positive?

(1) 6

(2) 7

(3) 8

(4) 9

6. In how many ways can 5 identical balls be distributed into 3 distinct boxes?

(1) 15

(2) 21

(3) 25

(4) 35

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7. A rectangle's length is twice its breadth. If the perimeter is 60 cm, what is its area?

(1) 100 cm²

(2) 150 cm²

(3) 200 cm²

(4) 250 cm²

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8. What is the sum of the first 20 terms of the arithmetic sequence 3, 7, 11, . . . ?

(1) 820

(2) 840

(3) 860

(4) 880

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9. In a seating arrangement, 5 people (A, B, C, D, E) sit in a row. A and B must sit together, and C cannot sit at the ends. How many arrangements are possible?

(1) 24

(2) 36

(3) 48

(4) 60

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10. If $\log_2(x) + \log_4(x) = 5$, what is x?

(1) 8

(2) 16

(3) 32

(4) 64

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11. A circle is inscribed in an equilateral triangle with side length 12 cm. What is the radius of the circle?

(1) $2\sqrt{3}$ cm

(2) $3\sqrt{3}$ cm

(3) $4\sqrt{3}$ cm

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

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12. What is the value of $2^{100} \mod 5$?

(1) 1

(2) 2

(3) 3

(4) 4

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13. A and B can complete a task in 12 days, B and C in 15 days, and A and C in 20 days. How many days will A alone take?

(1) 24 days

(2) 30 days

(3) 36 days

(4) 40 days

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14. What is the sum of the series $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots$?

(1) 1

(2) 2

(3) 3

(4) 4

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15. If $3x + 4y = 12$ and $x - y = 1$, what is the value of $x + y$?

(1) 2

(2) 3

(3) 4

(4) 5

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16. A bag contains 4 red and 5 blue balls. Two balls are drawn without replacement. What is the probability that both are red?

(1) $\frac{2}{9}$

(2) $\frac{1}{6}$

(3) $\frac{1}{7}$

(4) $\frac{2}{7}$

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17. What is the value of $\sin 30^\circ + \cos 60^\circ$?

(1) 1

(2) $\frac{1}{2}$

(3) $\frac{\sqrt{3}}{2}$

(4) $\frac{3}{2}$

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18. A number when divided by 7 leaves a remainder of 4. What is the remainder when its square is divided by 7?

(1) 1

(2) 2

(3) 3

(4) 4

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19. The HCF of two numbers is 12, and their LCM is 144. If one number is 36, what is the other?

(1) 24

(2) 48

(3) 60

(4) 72

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20. A car travels at 60 km/h for half the distance and 80 km/h for the other half. What is the average speed for the entire journey?

(1) $\frac{200}{3}$ km/h

(2) $\frac{480}{7}$ km/h

(3) 70 km/h

(4) 72 km/h

21. What is the number of solutions to $|x - 2| = |x - 4|$?

(1) 1

(2) 2

(3) 3

(4) 4

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22. A pipe can fill a tank in 6 hours, and another pipe can empty it in 8 hours. If both are open, how long will it take to fill the tank?

(1) 18 hours

(2) 24 hours

(3) 30 hours

(4) 36 hours

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23. The sum of the first n natural numbers is 55. What is n?

(1) 8

(2) 9

(3) 10

(4) 11

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24. What is the area of a triangle with vertices at (0,0), (3,0), and (0,4)?

(1) 6

(2) 8

(3) 10

(4) 12

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25. If $x^2 + y^2 = 25$ and $xy = 12$, what is $x + y$?

(1) 5

(2) 7

(3) 9

(4) 11

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26. A man invests Rs. 5000 at 6% simple interest per annum. How much interest will he earn in 3 years?

(1) Rs. 800

(2) Rs. 900

(3) Rs. 1000

(4) Rs. 1100

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27. What is the value of $\sqrt{50 + \sqrt{50 + \sqrt{50 + \ldots}}}$?

(1) 5

(2) 6

(3) 7

(4) 8

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28. The ratio of ages of A and B is 3:4. After 6 years, their ages will be in the ratio 4:5. What is A's current age?

(1) 18

(2) 24

(3) 30

(4) 36

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29. A number is divisible by 3 and 5. What is the smallest such number greater than 100?

(1) 105

(2) 120

(3) 135

(4) 150

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30. What is the sum of digits of 2^{10}?

(1) 7

(2) 8

(3) 9

(4) 10

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31. A boat travels 24 km upstream in 6 hours and 30 km downstream in 5 hours. What is the speed of the boat in still water?

(1) 5 km/h

(2) 6 km/h

(3) 7 km/h

(4) 8 km/h

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32. What is the value of x if $2^x \cdot 3^{x+1} = 486$?

(1) 2

(2) 3

(3) 4

(4) 5

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33. In how many ways can 6 people be seated around a circular table?

(1) 120

(2) 360

(3) 720

(4) 1440

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34. What is the probability that a leap year has 53 Sundays?

(1) $\frac{1}{7}$

(2) $\frac{2}{7}$

(3) $\frac{3}{7}$

(4) $\frac{4}{7}$
