

# CAT 2014 QA Slot 1 Question Paper

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| Time Allowed :2 Hours | Maximum Marks :198 | Total Questions :66 |
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## General Instructions

Read the following instructions very carefully:

1. The total duration of the test is **2 hours**, with **40 minutes** allotted per section.
2. The question paper is divided into **three sections**:
  - **Section 1:** Verbal Ability and Reading Comprehension (VARC) – 24 questions
  - **Section 2:** Data Interpretation and Logical Reasoning (DILR) – 20 questions
  - **Section 3:** Quantitative Aptitude (QA) – 22 questions
3. Each correct answer carries **+3 marks**.
4. For multiple-choice questions (MCQs), **–1 mark** will be deducted for each wrong answer.
5. There is **no negative marking** for Type-in-the-Answer (TITA) questions.
6. Once the allotted time for a section ends, you will automatically move to the next section. You cannot go back to a previous section.
7. All answers must be entered on the computer screen using the mouse and keyboard. Rough sheets will be provided.
8. The use of calculators, mobile phones, or any other electronic device is strictly prohibited. An on-screen basic calculator will be provided.

**Q1.** If  $f_1(x) = \frac{2}{2+x}$  and  $f_n(x) = \frac{1}{1+f_{n-1}(x)}$ , where  $n > 1$ , then find the approximate value of  $f_{50}(1)$ .

- (A) 0.128
  - (B) 0.618
  - (C) 0.666
  - (D) 0.45
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**Q2.** Each of A, B, and C had some marbles. B distributed half the marbles with him among A and C in the ratio 1:3. Then C distributed half the marbles with him among A and B in the ratio 1:3. After that, A distributed half the marbles with him among B and C in the ratio 1:3. If each of them now has 64 marbles, find the difference between the number of marbles with A and C in the beginning.

- (A) 43
  - (B) 67
  - (C) 110
  - (D) 108
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**Q3.** There are 24 Rosagollas and 36 Kulfis in a box. Anil eats only Rosagollas at  $x$  per minute, Anand eats only Kulfis at  $y$  per minute, and Abhilash eats  $2x$  Rosagollas and  $3y$  Kulfis per minute. After two minutes, the number of Rosagollas and Kulfis left is equal. Find the ratio of Kulfis that Abhilash eats per minute to Rosagollas that Anil eats per minute.

- (A)  $\frac{2}{9}$
  - (B)  $\frac{3}{5}$
  - (C)  $\frac{9}{4}$
  - (D)  $\frac{9}{2}$
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**Q4.** The lengths of the sides of a right-angled triangle are in geometric progression. What is the ratio of the sines of its acute angles?

- (A) 1
  - (B)  $\sqrt{3}$
  - (C)  $\frac{\sqrt{5}+1}{2}$
  - (D)  $\frac{\sqrt{5}-1}{2}$
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**Q5.** Rohan and Sohan start from the same point on a circular track in the same direction. Speed of Rohan is nine times Sohan. How many times are they diametrically opposite by the time Sohan completes 3 rounds?

- (A) 27
  - (B) 23
  - (C) 48
  - (D) 24
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**Q6.** Harry Potter bought a triangular piece of land of area  $150 \text{ m}^2$ . Harry measured two sides of the plot and found the largest side to be 50 m and another side to be 10 m. Find the exact length of the third side.

- (A)  $40\sqrt{3} \text{ m}$
  - (B)  $30\sqrt{2} \text{ m}$
  - (C)  $\sqrt{1560} \text{ m}$
  - (D)  $24\sqrt{2} \text{ m}$
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**Q7.** Find the total number of ways in which one can wear three distinct rings on the five fingers of one's right hand, given that one is allowed to wear more than one ring on a finger.

- (A) 120
  - (B) 360
  - (C) 480
  - (D) 210
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**Q8.** In a casino, there are three coloured tokens — Red (20), Green (50), Blue (100). Total worth 18,500. On a busy day, all Red tokens were upgraded to 200 (no change in Green/Blue). New worth: 27,500. Average number of tokens per colour equals the number of Green tokens. Find the total number of tokens.

- (A) 150
  - (B) 180
  - (C) 270
  - (D) 288
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**Q9.** If  $a_1, a_2, \dots, a_n$  ( $n > 3$ ) are all unequal positive real numbers and

$$E = \frac{(1 + a_1 + a_1^2)(1 + a_2 + a_2^2) \dots (1 + a_n + a_n^2)}{a_1 a_2 \dots a_n},$$

then which of the following best describes  $E$ ?

- (A)  $E \leq 2^n$
- (B)  $E \geq 3^n$
- (C)  $E > 3^n$

(D)  $E > 2^n$

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**Q10.** For an odd positive integer  $n$  ( $51 \leq n \leq 99$ ), the quantity  $n^3 - n$  is always divisible by:

- (A) 48
  - (B) 24
  - (C) 18
  - (D) None of these
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**Q11.** On a certain day, the sum of the date and the square root of the month gives the square of the month. Find the date.

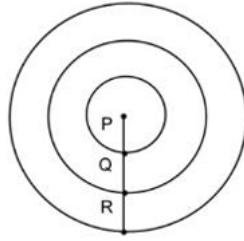
- (A) 14th February
  - (B) 16th April
  - (C) 16th February
  - (D) 14th April
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**Q12.** In a timber mill, cylindrical logs arrive as input and are cut into smaller cylindrical pieces of the same radius using manual and mechanized saws. Manual saw: requires 4 workers, takes 2 hours to cut a log into 2 pieces. Mechanized saw: requires 2 workers, takes 1 hour to cut the same log into 2 pieces. Time to cut is proportional to the cross-sectional area. If 12 workers must cut 60 logs into 4 equal pieces each, using 2 mechanized saws and 2 manual saws, find the total time required.

- (A) 40 hours
  - (B) 80 hours
  - (C) 120 hours
  - (D) 60 hours
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**Q13.** Three persons A, B, and C start running simultaneously on three concentric circular tracks from three collinear points P, Q, and R respectively, which are collinear with the centre and on the same side of the centre. The speeds of A, B, and C are 5 m/s, 9 m/s, and 8 m/s respectively. The lengths of the tracks are: A: 400 m, B: 600 m, C: 800 m.

A and B run clockwise, and C runs anti-clockwise. Find the first time after they start when A, B, and C are collinear with the centre and on the same side of the centre.

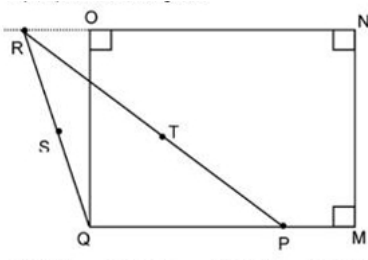


- (A) 200 seconds  
 (B) 400 seconds  
 (C) 600 seconds  
 (D) 800 seconds

**Q14.** A rectangle MNOQ has  $NO$  extended to point R. In  $\triangle QPR$ :

- $QP = \frac{2}{3}QM$
- $\angle ORP = 45^\circ$
- $QR = 4\sqrt{17}$  cm

S and T are midpoints of sides QR and PR respectively. If  $ST = 6$  units, find the area of rectangle MNOQ.



- (A) 112  
 (B) 144  
 (C) 288  
 (D) 256

**Q15.** A series in which any term is equal to the sum of the preceding two terms is called a Fibonacci series. The first two terms are given initially and determine the series. It is known that the difference of the squares of the ninth and eighth terms of a Fibonacci series is 840. Find the 12th term of that series.

- (A) 157  
 (B) 142  
 (C) 143  
 (D) Cannot be determined

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**Q16.** The numbers  $1, 2, \dots, n$  are written in natural order. Numbers in odd places are struck off to form a new sequence. This process is continued until only one number is left. If  $n = 1997$ , find the last remaining number.

- (A) 1996
- (B) 1988
- (C) 512
- (D) 1024

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**Q17.** A is a non-empty set having  $n$  elements. P and Q are two subsets of A such that  $P \subseteq Q$ . Find the number of ways of choosing the subsets P and Q.

- (A)  $4^n$
- (B)  $3^n$
- (C)  $2^n$
- (D)  $n^2$

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**Q18.** A can do a work in 18 days more than the time taken by A and B together. B can do the same work in 8 days more than the time taken by A and B together. They agree to work with C and complete the work in 10 days. Total payment = 18000. Find C's share.

- (A) 500
- (B) 2000
- (C) 3000
- (D) 4500

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**Q19.** Lal divides his garden into several identical squares and places posts at all the corners of all the squares. He then plants one tree per square. If a rectangular garden uses 36 posts in all, find the maximum number of trees that he could have planted.

- (A) 25
  - (B) 36
  - (C) 16
  - (D) 49
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**Q20.** Find the sum of the series:

$$1 + \frac{2}{11} + \frac{5}{12} + \frac{10}{13} + \frac{17}{14} + \dots$$

- (A)  $\frac{154}{125}$
  - (B)  $\frac{32}{25}$
  - (C)  $\frac{363}{250}$
  - (D)  $\frac{215}{175}$
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**Q21.** In how many ways can 40 sweets be given to A, B, C, and D such that:

- B gets at least 3 sweets,
- D gets at least 5 sweets,
- A and C may get zero sweets.

- (A) 4960
  - (B) 6545
  - (C) 9139
  - (D) 15
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