S I M S®

(SCHOLARS INTEGRAL MATHS & SCIENCE OLYMPIADS)

CLASS X

BIGGEST NATIONAL LEVEL OLYMPIADS (STAGE - II) : 2025-26

MAX. MARKS : 90 | **SIMO QUESTION PAPER** | **TIME: 60 MIN.**

NAME OF THE STUDENT : .....

HALL TICKET NUMBER : .....

NAME OF THE SCHOOL : .....

INSTRUCTIONS:

- This question paper contains 30 questions.
- First 25 questions (1 to 25) are single correct answer type. Each question carries 3 marks.
- Next 5 questions (26 to 30) are one or more than one correct answer type. Each question carries 3 marks.
- No negative marks.
- You have not allowed to use a calculator or any other electronic devices in the examination hall.
- Read the instructions given in the answer sheet(OMR sheet) before answering the questions.
- The answer sheet should be returned to the invigilator before leaving the examination hall (You can retain the question paper with you)
- Results will be available at www.simsolympiads.com

Single Correct Answer Type: 25 × 3 = 75

1. The sum of n terms of the series $\frac{1}{\sqrt{1}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{7}}+\ldots$ is

1) $\frac{\sqrt{2n+1}}{1}$ 2) $\frac{-1+\sqrt{2n+1}}{2}$ 3) $\frac{1}{\sqrt{2n+1}}$ 4) $\sqrt{2n-1}$

2. If the sum of LCM and HCF of two rational numbers is 1260 and their LCM is 900 more than their HCF, then the product of two numbers is _____.

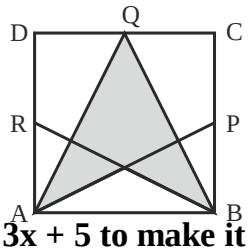
1) 203400 2) 194400 3) 198400 4) 205400

3. If α, β are the zeros of the polynomial $f(x) = ax^2 + bx + c$, then $\frac{1}{\alpha^2}+\frac{1}{\beta^2}$ = _____.

1) $\frac{b^2-2ac}{a^2}$ 2) $\frac{b^2+2ac}{c^2}$ 3) $\frac{b^2-4ac}{2a}$ 4) $\frac{b^2-2ac}{c^2}$

4. Let ABCD be a square with the length of side equal to 12 cm. The points P, Q and R are the midpoints of sides BC, CD and DA respectively. Calculate the area of the shaded region.

1) 96 sq.cm
2) 72 sq.cm
3) 60 sq.cm
4) 54 sq. cm



5. What should be added to $x^3 - 2x^2 + 3x + 5$ to make it exactly divisible by (x–1) ?

1) –7 2) 7 3) 3 4) 9

6. $\left[\frac{\tan x}{\sec x + 1} + \frac{\sec x + 1}{\tan x}\right] \sin x$ = _____.

1) 1 2) 2 3) 0 4) –1

7. If $x = \sqrt{7 + \sqrt{1 + \sqrt{7 + \sqrt{1 + \sqrt{7 + ...}}}}}$ **then $x^4 - 14x^2 - x$ = ___.**

1) 50 2) –50 3) 48 4) –48

8. If the roots of the equation $5x^2 - 7x + k = 0$ are sin A and cos A, then the value of k is

1) $\frac{12}{5}$ 2) $\frac{49}{10}$ 3) 7 4) $\frac{24}{25}$

9. A ladder is leaning against a house with its lower end 15 m, from the house. When the lower is pulled 9 m, farther from the house, the upper end slides 13 m down. How long is the ladder ?

1) 18 m 2) 25 m 3) 32 m 4) 24 m

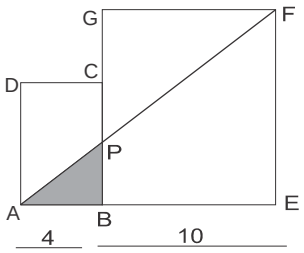
10. In a trapezium ABCD with $\overline{AB} \parallel \overline{CD}$, AB = 20 cm, CD = 3 cm, $\angle ABC = 32^o$ and $\angle BAD = 58^o$. The distance from the midpoint of AB to the midpoint of CD is

1) $\frac{23}{2}$ cm 2) 13 cm 3) $\frac{17}{2}$ cm 4) 7 cm

11. Let $a, b, c \in Q^+ - \{1\}$. If $\log_a[1 + \log_b[1 + \log_c x]] = 0$, then the value of $\log_a x$ is ____.

1) $\frac{1}{2}$ 2) 1 3) 4 4) 0

12. In the figure, ABCD and BEFG are two squares with side lengths 4 cm and 10 cm respectively. The area of the shaded region is _____ sq.cm.

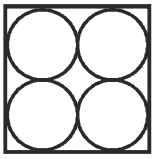


1) 7 2) $\frac{20}{7}$ 3) $\frac{40}{7}$ 4) $\frac{10}{7}$

13. If $p^x = q^y = r^z$ and $q^2 = pr$ then $\frac{1}{x} + \frac{1}{z} =$

1) $\frac{1}{y}$ 2) $\frac{2}{y}$ 3) 0 4) y^2

14. Four identical coins are placed in a square. For each coin, the ratio of the area to circumference is same as the ratio of circumference to area. Find the area of the square that is not covered by the coins.



1) 16 sq. units 2) 13.45 sq. units 3) 13.76 sq. units 4) 77.76 sq. units

15. The mean of 100 items was found to be 30. If at the time of calculation two items are wrongly taken as 32 and 12 instead of 23 and 11, find the correct mean.

1) 29.9 2) 30.1 3) 30.34 4) 29.56

16. In a ΔABC, AB = AC. A transversal intersects AB and AC internally at K and L respectively. It intersects BC produced at M. If KL = 2LM, then the value of $\frac{KB}{LC}$ is

1) $\frac{2}{3}$ 2) $\frac{1}{2}$ 3) $\frac{4}{3}$ 4) 3

17. Find the area of right angled triangle, if the diameter of its circumcircle is 10 cm and altitude drawn to the hypotenuse is 4.5cm long.

1) 22.5 cm 2) 22.5 cm^2 3) 23.5 cm^2 4) 24.5 cm^2

18. A and B are friends and their ages differ by 2 years. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 40 years. Find the age of B.

1) 27 yrs. 2) 26 yrs. 3) 24 yrs. 4) 32 yrs.

19. If $\Delta ABC \sim \Delta DEF$ such that AB = 9.1 cm and DE = 6.5 cm. If the perimeter of ΔDEF is 25 cm, then the perimeter of ΔABC is _____.

1) 49 cm 2) 20 cm 3) 34 cm 4) 35 cm

20. If $A + B = 90^o$ then $\frac{\tan A\tan B + \tan A\cot B}{\sin A\sec B} - \frac{\sin^2 B}{\cos^2 A}$ is equal to

1) $\cot^2 A$ 2) $\cot^2 B$ 3) $-\tan^2 A$ 4) $-\cot^2 A$

21. $(1+\tan\theta+\sec\theta)(1+\cot\theta-\operatorname{cosec}\theta)$ = _____.

1) 2 2) 1 3) 0 4) –1

22. The sum of two numbers is 15. If the sum of their reciprocals is $\frac{3}{10}$, find the numbers.

1) 10 and 5 2) 7 and 8 3) 9 and 6 4) 11 and 4

23. A dealer sells a toy for ` 24 and gains as much percent as the cost price of the toy. Find the cost price of the toy.

1) ` 40 2) ` 20 3) ` 28 4) ` 16

24. If two digit number is chosen at random, then the probability that the number chosen is a multiple of 3 is

1) $\frac{3}{10}$ 2) $\frac{11}{30}$ 3) $\frac{1}{3}$ 4) $\frac{7}{25}$

25. If the co-ordinates of one end of a diameter of a circle are (2, 3) and the coordinates of its centre are (–2, 5), then the coordinates of the other end of the diameter are

1) (–6, 7) 2) (0, 4) 3) (6, 7) 4) (–6, –7)

One or More Correct Answer Types : 5× 3 = 15M

26. Let A and B are two non empty sets. Given that n(U) = 12, n(A) = 7, n(B) = 8 and n(A∩B) = 5.

1) n(A–B) = 2 2) n(AΔB) = 5 3) n(A' ∪ B') = 7 4) n(A' ∩ B') = 3

27. If the mean of the following frequency distribution is 62.8 and the sum of all frequencies is 50, then the missing frequencies f_1 and f_2 are _____.

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Frequency	5	f_1	10	f_2	7	8

1) $f_1 = 8$ 2) $f_2 = 12$ 3) $f_2 = 15$ 4) $f_1 = 7$

28. Find the set of values of x satisfying $2 \le |x-1| \le 5$.

1) $-3 \le x \le 6$ 2) $4 \le x \le 7$ 3) $3 \le x \le 6$ 4) $-4 \le x \le -1$

29. A bag contains 5 red, 3 white and 2 blue balls. If one ball is drawn then the probability that the ball is

1) Probability of red is $\frac{1}{2}$ 2) Probability of white is $\frac{3}{5}$

3) Probability of blue is $\frac{1}{5}$ 4) Probability of red is $\frac{1}{4}$

30. For $x^2 + 2x + 5$ to be a factor of $x^4 + px^2 + q$, then the values of p and q is _____.

1) q = 50 2) p = 6 3) q = 25 4) p = 5

*** ***ALL THE BEST*** ***