



SOF INTERNATIONAL MATHEMATICS OLYMPIAD

SYLLABUS

Section – 1 : Verbal and Non-Verbal Reasoning.

Section – 2 : Number Systems, Polynomials, Coordinate Geometry, Linear Equations in Two Variables, Introduction to Euclid's Geometry, Lines and Angles, Triangles, Quadrilaterals, Areas of Parallelograms and Triangles, Circles, Constructions, Heron's Formula, Surface Areas and Volumes, Statistics, Probability.

Section – 3 : The syllabus of this section will be based on the syllabus of Mathematical Reasoning and Quantitative Aptitude.

Section – 4 : Higher Order Thinking Questions - Syllabus as per Section – 2.

Total Questions : 50

Time : 1 hr.

PATTERN & MARKING SCHEME				
Section	(1) Logical Reasoning	(2) Mathematical Reasoning	(3) Everyday Mathematics	(4) Achievers Section
No. of Questions	15	20	10	5
Marks per Ques.	1	1	1	3

LOGICAL REASONING

1. If L denotes \div , M denotes \times , P denotes $+$ and Q denotes $-$, then which of the following options is correct?

- (A) $32 P 8 L 16 Q 4 = -\frac{3}{2}$
- (B) $6 M 18 Q 26 L 13 P 7 = \frac{173}{13}$
- (C) $11 M 34 L 17 Q 8 L 3 = \frac{38}{3}$
- (D) $9 P 9 L 9 Q 9 M 9 = -71$

2. Which of the following options satisfy the same conditions of placement of the dots as in Fig. (X)?

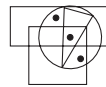
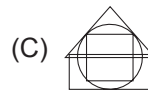
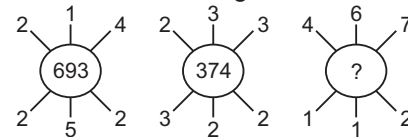


Fig. (X)

- (A)
- (B)



3. Find the missing number, if the same rule is followed in all the three figures.



- (A) 937
- (B) 824
- (C) 769
- (D) 606

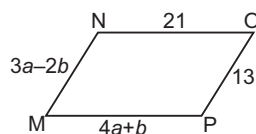
4. Complete the given pattern.

6, 11, 21, 36, 56, (?)

- (A) 42
- (B) 51
- (C) 81
- (D) 91

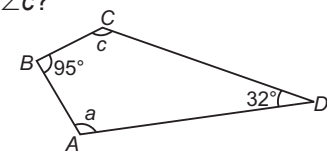
MATHEMATICAL REASONING

5. What values of a and b make quadrilateral MNOP a parallelogram?



- (A) $a = 1, b = 5$
- (B) $a = 5, b = 1$
- (C) $a = \frac{11}{7}, b = \frac{34}{7}$
- (D) $a = \frac{34}{7}, b = \frac{11}{7}$

6. For the quadrilateral shown here, what is the value of $\angle a + \angle c$?



- (A) 53°
- (B) 137°
- (C) 180°
- (D) 233°

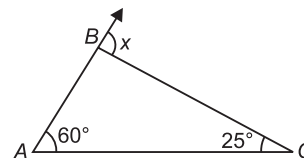
7. Simplify : $\frac{16 \times 2^{n+1} - 4 \times 2^n}{16 \times 2^{n+2} - 2 \times 2^{n+2}}$

- (A) 1
- (B) 6/11
- (C) 0
- (D) 1/2

8. Find the remainder when $p(y) = y^3 + y^2 + 2y + 3$ is divided by $y + 2$.
- (A) 1 (B) 4
(C) -5 (D) 3

9. The ordinate of any point on x-axis is _____.
- (A) 0 (B) 1
(C) -1 (D) Any number

10. What is the value of x ?



- (A) 35° (B) 60°
(C) 85° (D) 95°

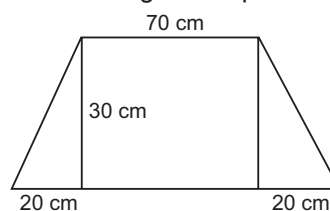
EVERYDAY MATHEMATICS

11. A right circular cone has radius 5 cm and height 8 cm. What is the lateral surface area of the cone?
- (A) 40π sq. cm
(B) 445π sq. cm
(C) $5\pi\sqrt{39}$ sq. cm
(D) $5\pi\sqrt{89}$ sq. cm

12. Vikas has ₹($x^3 + 2ax + b$), with this money he can buy exactly $(x - 1)$ jeans or $(x + 1)$ shirts with no money left. How much money Vikas has, if $x = 4$?

- (A) ₹ 80 (B) ₹ 120
(C) ₹ 30 (D) ₹ 60

13. Find the area of the given trapezium.



- (A) 2900 cm^2 (B) 3000 cm^2
(C) 2100 cm^2 (D) 2700 cm^2

ACHIEVERS SECTION

14. Select the correct match.

Let $f(x) = \frac{(x-2)(x-4)}{x}$

- (A) $f(x)$ is a polynomial - As $(x - 2)$, $(x - 4)$, x are polynomials
(B) $f(x)$ is an equation - As it can be written as $ax^2 + bx + c$
(C) $f(x)$ is a rational number - As it is of the form $\frac{p}{q}$, $q \neq 0$
(D) $f(x)$ is not a polynomial - As the exponents of x are not whole numbers.

15. The marks scored by some students for a question in the Science test are shown in the table given below.

Marks	0	1	2	3	4	5
Number of students	3	2	3	5	x	1

- (a) If the mode is 4, then write down the smallest possible value of x .
(b) If the mean is $2\frac{1}{4}$, then find the value of x .
- (a) (b)
(A) 6 2
(B) 5 2
(C) 6 4
(D) 6 3

SPACE FOR ROUGH WORK

ANSWERS

1. (D) 2. (D) 3. (D) 4. (C) 5. (B) 6. (D) 7. (D) 8. (C) 9. (A) 10. (C) 11. (D) 12. (D) 13. (D) 14. (D) 15. (A)