CLASS
11
SAMPLE PAPER 2026-27

SCIENCE OLYMPIAD FOUNDATION

SOF INTERNATIONAL MATHEMATICS OLYMPIAD

Total Questions : 50 Time : 1 hr.

PATTERN & MARKING SCHEME

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

SYLLABUS

Section – 1 : Verbal and Non-Verbal Reasoning.

Section – 2 : Sets, Relations and Functions, Logarithms, Principle of Mathematical Induction, Complex Numbers and Quadratic Equations, Linear Inequalities, Sequences and Series, Trigonometry, Straight Lines, Conic Sections, Permutations and Combinations, Binomial Theorem, Statistics, Limits and Derivatives, Probability, Introduction to 3-D Geometry.

OR

Section – 2 : Numbers, Quantification, Numerical Applications, Sets, Relations and Functions, Sequences and Series, Permutations and Combinations, Mathematical Reasoning, Limits, Continuity and Differentiability, Probability, Descriptive Statistics, Basics of Financial Mathematics, Straight Lines, Circle, Parabola.

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

Section – 4 : Sets, Relations and Functions, Sequences and Series, Permutations and Combinations, Limits and Derivatives, Straight Lines, Circle, Parabola, Probability.

LOGICAL REASONING

1. Study the given information carefully and answer the following question.
'A × B' means 'A is the father of B'.
'A + B' means 'A is the brother of B'.
'A – B' means 'A is the brother-in-law of B'.
'A * B' means 'A is the mother of B'.
'A # B' means 'A is the son-in-law of B'.
Which of the following definitely means K is the wife of L?
(i) J × N + L # M * K (ii) N + L – M × K # J (iii) J * L + N – K × M
(A) Only (i) (B) Only (ii) and (iii) (C) Only (i) and (ii) (D) None of these

2. Ankita and Varun are 150 m apart and facing towards each other. Ankita took a left turn and walked 30 m, while Varun also took a left turn and walked 50 m. Ankita then took two consecutive right turns walking 70 m in each turn. Meanwhile Varun took a right turn and stopped after walking 40 m. If Varun is now facing towards West direction, then how far and in which direction is Ankita now with respect to Varun?

(A) $10\sqrt{17}$ m, North-West

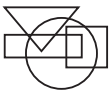
(B) $10\sqrt{17}$ m, North-East

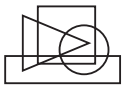
(C) $10\sqrt{17}$ m, South-West

(D) $17\sqrt{10}$ m, North-West

3. Which of the following figures satisfies the same conditions of placement of the dots as in the given figure?



(A) 

(B) 

(C) 

(D) 

MATHEMATICAL REASONING

4. The domain of $f(x) = \sqrt{\frac{4-x^2}{2+[x]}}$, where $[x]$ is G.I.F., is

(A) $[-2, 2]$

(B) $(-1, 2)$

(C) R

(D) None of these

5. If A, B, C, D are the angles of a quadrilateral, then $\frac{\tan A+\tan B+\tan C+\tan D}{\cot A+\cot B+\cot C+\cot D}$ =

(A) $\cot A \cot B \cot C \cot D$

(B) $-\tan A \tan B \tan C \tan D$

(C) $\tan A \tan B \tan C \tan D$

(D) $-\cot A \cot B \cot C \cot D$

6. If the mean deviation of the numbers 1, $1 + d$, $1 + 2d$, ..., $1 + 100d$ from their mean is 255, then d is equal to

(A) 10.0

(B) 20.0

(C) 10.1

(D) 20.2

APPLIED MATHEMATICS

4. Calculate quartile deviation for the data:

Class	0-15	15-30	30-45	45-60	60-75	75-90	90-105
f	8	26	30	45	20	17	4

(A) 30.87

(B) 15.4375

(C) 0.3271

(D) 0.6542

5. The result obtained by subtracting binary number 111010 from 11100100 is
(A) 10101010 (B) 10010001
(C) 100100101 (D) 10010011

6. The ranks of the same 15 students in two subjects *A* and *B* are given below; the two numbers within the brackets denoting the ranks of the same student in *A* and *B* respectively.
(1, 9), (2, 8), (3, 2), (4, 6), (5, 4), (6, 7), (7, 3), (8, 1), (9, 11), (10, 15), (11, 10), (12, 5), (13, 14), (14, 12), (15, 13).
Find Spearman's rank correlation coefficient.
(A) 0.54 (B) 0.46
(C) 0.42 (D) 0.32

EVERYDAY MATHEMATICS

7. Raghav buys a shop for ₹ 120000. He pays half of the amount in cash and agrees to pay the balance in 12 annual installments of ₹ 5000 each. If the rate of interest is 12% and he pays with the installment the interest due on the unpaid amount, then find the total cost of the shop.
(A) ₹ 168600 (B) ₹ 176800
(C) ₹ 176600 (D) ₹ 166800

8. 10 different toys are to be distributed among 10 children. Total number of ways of distributing these toys so that exactly 2 children do not get any toy, is equal to

(A) $(10!)^2\left(\frac{1}{3!2!7!}+\frac{1}{(2!)^5 6!}\right)$

(B) $(10!)^2\left(\frac{1}{3!2!7!}+\frac{1}{(2!)^4 6!}\right)$

(C) $(10!)^2\left(\frac{1}{3!7!}+\frac{1}{(2!)^5 6!}\right)$

(D) None of these

ACHIEVERS SECTION

9. Solve the following and select the correct option.
(i) Six letter words are formed using all the letters of the word NUMBER. If these words are arranged in the dictionary order, then the rank of the word NUMBER is
(ii) The number of odd numbers greater than 60,000 and less than 1,00,000 that can be formed from the digits 0, 5, 6, 7, 8, 9, if repetition of digits is allowed, is

	(i)	(ii)
(A)	465	2592
(B)	471	1560
(C)	469	2592
(D)	469	1440

10. Read the given statements carefully and state 'T' for true and 'F' for false.

(i) If the value of $\lim_{x\to 0}\frac{(1-x)^n-1}{x}$ is 100, then $n = 100$.

(ii) If $\lim_{x\to 1}\frac{x^4-1}{x-1}=\lim_{x\to k}\frac{x^3-k^3}{x^2-k^2}$, then $k=\frac{3}{8}$.

(iii) Let $f(x) = x^2 + bx + 7$. If $f'(5) = 2f'\left(\frac{7}{2}\right)$, then the value of b is -4.

	(i)	(ii)	(iii)
(A)	T	F	T
(B)	F	F	T
(C)	F	T	F
(D)	F	T	T

ANSWER KEY

1. (D) 2. (A) 3. (B)
MATHEMATICAL REASONING 4. (D) 5. (C) 6. (C)
APPLIED MATHEMATICS 4. (B) 5. (A) 6. (A)
7. (D) 8. (B) 9. (C) 10. (B)