SYLLABUS AND MODEL QUESTIONS OF MATHEMATICS OLYMPIAD

EXAM TIME: - 11:30 TO 12:20
(For secondary level students)

SECTION	LOGICAL RESONING	MATHEMATICAL RESONING	EVERY DAY MATHEMATICS	ACHIVERS SECTION	TOTAL
No. of Questions	7	10	5	3	25
Marks per Question	2	2	2	2	
Total Marks	14	20	10	6	50

NOTE: 0.5 MARKS will be deducted for each wrong answer.

LOGICAL RESONING SECTION: **This section includes verbal and non-verbal reasoning questions from any field.**

MATHEMATICAL RESONING SECTION: **This section includes Number theory, Polynomials, Equations in Two Variables, Quadratic Equations, Sequence and Series, Triangles, Coordinate Geometry, Some Applications of Trigonometry, Circles, Surface Areas and Volumes, Statistics, Probability, Arrangement and Selection of Objects .**

*EVERYDAY MATHEMATICS SECTION***: This section includes the syllabus of mathematical reasoning and quantitative aptitude in real life problem.**

*ACHIVERS SECTION***: This is a problem solving section related to mathematical reasoning's that requires higher level mathematical skills .**

MODEL QUESTION

MARK (√) THE CORRECT ANSWER .

1.Arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence. (1) Page   (2) pagan   (3) Palisade   (4) pageant (5) palate.

**(a)1,4,2,3,5   (b) 2, 4, 1, 3, 5   (c) 2, 1, 4, 5, 3   (d) 1, 4, 2, 5, 3**

2.Ram was looking for his father. He went 90 meters to the East and turns right. He went 20 meters from the point and again turns right. He went 30 meters and from there, he went 100 meters to the North before meeting his father. How far did the son meet his father from the starting point?

(A) 80 meters   (B) 100 meters   (C) 140 meters   (D) 260 meters

3. If + stands for 'division', × stands for 'addition', – stands for 'multiplication' and ÷ stands for 'subtraction', which one of the following statements is correct?

    a. $36 \times 6 + 7 \div 2 - 6 = 20$
    b. $36 \div 6 + 3 \times 5 - 3 = 45$
    c. $36 + 6 - 3 \times 5 \div 3 = 24$
    d. $36 - 6 + 3 \times 5 \div 3 = 74$

4. How many triangles are there in the adjoining figure?
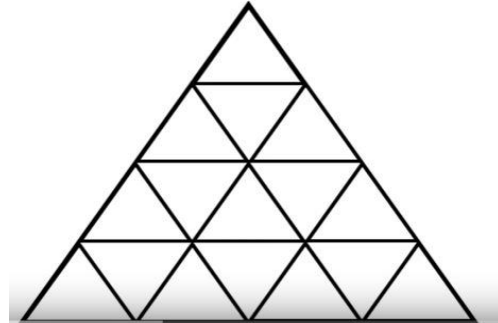
    a. 12
    b. 18
    c. 27
    d. 25

5. If the HCF of 210 and 55 is expressible in the form $210 \times 5 + 55y$, find y.

(a) 5   (b) -15   (c) 14   (d) -19

6. Three ducks and two ducklings weigh 32 kg. Four ducks and three ducklings weigh 44 kg. All ducks weigh the same and all ducklings weigh the same. What is the weight of two ducks and one duckling?

(a) 20 kg   (b)40 kg   (c) 60 kg   (d) 64 kg

7. In the given sequence A 12, E 48, I 46, O 184 ……., what may be the next missing term?

(a) U 182   (b) U 186   (c) U 188   (d) U 198

8. There is a circular path around a field. Priya takes 18 minutes to drive one round of the field, while Ravish takes 12 minutes for the same. Suppose they both start at the same point and at the same time and go in the same direction. After how many minutes will they meet again at the starting point?

(a) 54   (b) 24   (c)36   (d) 72

9. Find the value of x in the given figure.
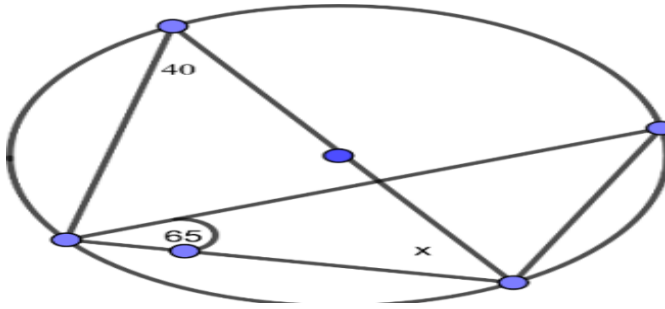
(a) 65^0 (b) 40^0 (c) 75^0 (d) 90^0

10. In the following system of equations, determine the value of k for which the given system of equations has a unique solution:

$2x - 3y = 1, kx + 5y = 7$

(a) $k \neq -\frac{5}{3}$ (b) $k \neq -\frac{10}{3}$ (c) $k \neq -\frac{3}{5}$ (d) $k = \frac{2}{3}$

11. If the mean of the following distribution is 54, find the value of p.

| Class	0-20	20 -40	40 - 60	60-80	80-100
frequency	7	P	10	9	13

(a) 9   (b) 11   (c) 8   (d) 10

12. The sum of three numbers in A.P. is –3, and their product is 8. Find the numbers.

(a) 2, –1, – 4   (b) – 4, –1, 2   (c) 4, –1, –2   (d) Both (a) and (b).

13. A copper sphere of diameter 18 cm is drawn into a wire of diameter 4 mm. Find the length of the wire.

(a) 240m   (b) 242m   (c) 243 m   (d) 245m

14. In the given figure (not drawn to scale), a circle with Centre O passes through A, B, C and D. $PDOB$ is a straight line and PAT is a tangent to the circle. If $\angle AOB = 112°$ and $AD = DC$. Find $\angle APO$ and $\angle ACB$ respectively.
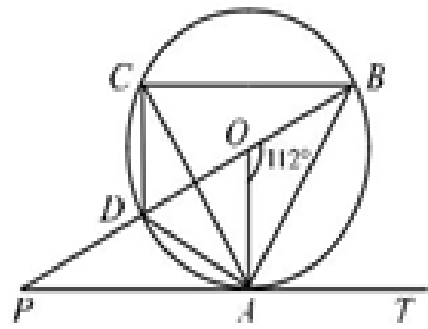
(a) 20°, 60°   (b) 28°, 56°   (c) 22°, 56°   (d) 38°, 68°

15. Find the value of the expression $3(\sin A - \cos A)^4 + 6(\sin A + \cos A)^2 + 4(\sin^6 A + \cos^6 A)$.

(a) 11   (b) 12   (c) 13   (d) 0

16. Mohit and Kunal are good in Hockey and Volleyball. Sachin and Mohit are good in Hockey and Baseball. Gaurav and Kunal are good in Cricket and Volleyball. Sachin, Gaurav and Rohit are good in Football and Baseball. Who is good in Baseball, Cricket, Volleyball and Football?

(a) Sachin   (b) Kunal   (c) Gaurav   (d)Mohit

17. What is the probability that a number selected from the numbers 1, 2, 3, ..., 25 is a prime number, when each of the given numbers is equally likely to be selected?

(a) 2/7   (b) 9/25   (c) 11/25   (d) 2/5

18. *A* can lay railway track between two given stations in 16 days and *B* can do the same job in 12 days. With the help of *C*, they did the job in 4 days only. Then *C* alone can do the job in

(a) 93 days   (b) 95 days   (c) 128 days   (d) 48 days

19. If the sum of nine consecutive whole number is 99 then the largest of these integer is

(a) 19   (b) 15   (c) 17   (d) 21

20. In the following display, each letter represents a digit.

3	B	C	D	E	8	G	H	I

If the sum of any three successive digits is 18, find the value of H.

(a) 6   (b) 9   (c) 7   (d) 12

21. If the particle of an article is increased by 15% and total number of articles sold is decreased by 10 %, find the profit percentage on the outlay.

(a) 5%   (b) 1.5%   (c) 3.5%   (d) 2.5%

22. Sound travels at the rate of 330 m/s. How many kilometers away is a thunder cloud when its sound follows the flash after 10 seconds ?
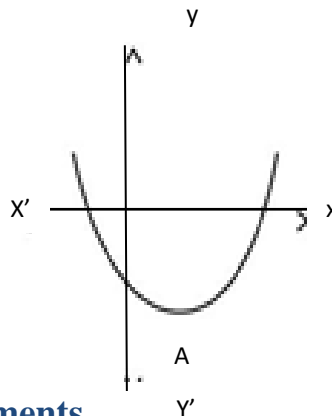
(a) 3.3   (b) 33   (c) 0.33   (d) 3.33

23. When the price of a gas cylinder increased by 20%, by what percent should a house holder reduce his consumption such that there is no increase in his expenditure?

(a) $16\frac{2}{3}\%$ (b) $33\frac{2}{3}\%$ (c)$32\frac{1}{3}\%$ (d) $10\frac{2}{3}\%$

24.   The graph of $y=ax^2 + bx + c$ is shown below
Identify the signs of a, b and c.

	a	b	c
A.	+ve	+ve	+ve
B.	+ve	-ve	-ve
C.	+ve	−ve	+ve
D.	−ve	+ve	−ve

25.   Consider the following statements.

Statements 1:-. The non zero real numbers a, b, c are in G.P. if b²=ac.

Statements2:- If the quadratic equation $(a^2+b^2) x^2 - 2(ab+bc)x+(b^2+c^2)=0$

has equal roots then a,b,c are in G.P. where a,b,c are real numbers.

Which of the following options is correct?
   (a) Statement-1 is true, statement-2 is false.
   (b) Statement-1 is false, statement-2 is true.
   (c) Both statements are false.
   (d) Both statements are true.

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