Olympiad Foundation

SAMPLE PAPER CLASS 10th

OLYMPIAD FOUNDATION

MATHEMATIC OLYMPIAD

Division of Marks

S.No.	Topic/Section	No. of Question	Marks
1	Mathematics	25	25
2	HOTS (High Order thinking Skill)	10	10
3	Reasoning & Mental Ability	15	15
	Total	50	50

INSTRUCTIONS :

1. Use Blue/Black ballpoint pen only to darken the appropriate circle.
2. Mark should be dark and should completely fill the circle.
3. Dark only one circle for each entry.
4. Dark the circle in the space provided only.
5. Rough work must not be done on the answer sheet and do not use white- fluid or any other rubbing material on Answer sheet.
6. Each question carries one mark.

TIME: 1 Hour **M.M.: 50**

Select the correct answer and darken your answer in the table :

MATHEMATICS

1. The product of a rational and irrational number is

   (A) Rational (B) Irrational

   (C) Both A & B (D) None of these

2. The sum of a rational and irrational number is

   (A) Rational (B) Irrational

   (C) Both A & B (D) None of above

3. The pair of equations $3x - 5y = 7$ and $-6x + 10y = 7$ have

   (A) A unique solution (B) Infinitely many solutions

   (C) No solution (D) Two solutions

4. If a pair of linear equations is consistent, then the lines will be

   (A) Always coincident (B) Parallel

   (C) Always intersecting (D) Intersecting or coincident

5. The polynomial equation $x(x + 1) + 8 = (x + 2)\{x - 2)$ is

   (A) Linear equation (B) Quadratic equation

   (C) Cubic equation (D) Bi-quadratic equation

6. The equation $(x - 2)^2 + 1 = 2x - 3$ is a

   (A) Linear equation (B) Quadratic equation

   (C) Cubic equation (D) Bi-quadratic equation

7. . Find the sum of 12 terms of an A.P. whose nth term is given by $a_n = 3n + 4$

   (A) 262 (B) 272

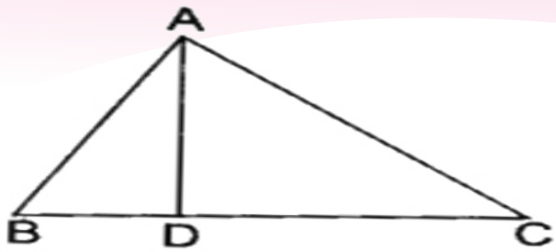
   (C) 282 (D) 292

8. If $(p + q)^{th}$ term of an A.P. is m and $(p – q)^{tn}$ term is n, then pth term is

(A) mn (B) mn

(C) $\frac{1}{2}(m - n)$ (D) $\frac{1}{2}(m + n)$

9. In $\angle BAC = 90°$ and $AD \perp BC$. A Then



(A) $BD.CD = BC^2$ (B) $AB.AC = BC^2$

(C) $BD.CD = AD^2$ (D) $AB.AC = AD^2$

10. D and E are respectively the points on the sides AB and AC of a triangle ABC such that AD = 2 cm, BD = 3 cm, BC = 7.5 cm and DE || BC. Then, length of DE (in cm) is -

(A) 2.5 (B) 3

(C) 5 (D) 6

11. If the distance between the points (x, -1) and (3, 2) is 5, then the value of x is

(A) -7 or -1 (B) -7 or 1

(C) 7 or 1 (D) 7 or -1

12. The points (1,1), (-2, 7) and (3, -3) are

(A) Vertices of an equilateral triangle (B) Collinear

(C) Vertices of an isosceles triangle (D) None of these

13. The coordinates of the centroid of a triangle whose vertices are (0, 6), (8,12) and (8, 0) is

(A) (4, 6) (B) (16, 6) (C) (8, 6) (D) (16/3, 6)

14. If $x \tan 45° \sin 30° = \cos 30° \tan 30°$, then x is equal to

(A) $\sqrt{3}$ (B) 12 (C) $12\sqrt{}$ (D) 1

15. If x and y are complementary angles, then

(A) Sin x = Sin y (B) Tan x = Tan y

(C) Cos x = Cos y (D) Sec x = Cosec y

16. Sin 2B = 2 sin B is true when B is equal to

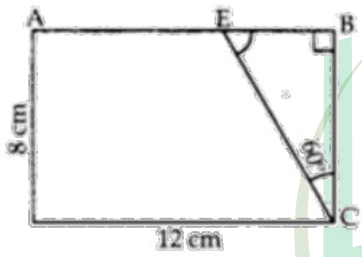
(A) 90° (B) 60° (C) 30° (D) 0°

17. If A, B and C are interior angles of a ΔABC then cos(B+C2) is equal to

(A) $\sin \frac{A}{2}$ (B) $-\sin \frac{A}{2}$

(C) $\cos \frac{A}{2}$ (D) $-\cos \frac{A}{2}$

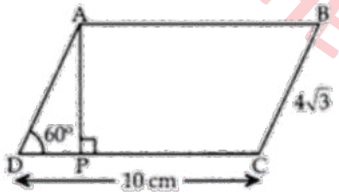
18. In figure given ABCD is a rectangle, the value of CE is



(A) 1 cm (B) 2 cm

(C) 3 cm (D) 4 cm

19. 19. In given figure, ABCD is a || gm. The lenght of AP is



(A) 2 cm (B) 4 cm

(C) 6 cm (D) 8 cm

20. When the length of shadow of a vertical pole is equal to √3 times of its height, the angle of elevation of the Sun's altitude is

(A) 30° (B) 45°

(C) 60° (D) 15°

21. The angle of elevation of top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. The length of the tower is

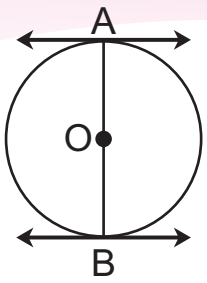
(A) $\sqrt{3}$ m

(B) $2\sqrt{3}$ m

(C) $5\sqrt{3}$m

(D) $10\sqrt{3}$ m

22. The distance between two parallel tangents of acircle of radius 4 cm is



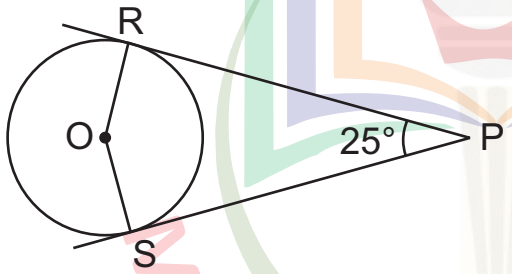
(A) 2 cm

(B) 4 cm

(C) 6 cm

(D) 8 cm

23. In the given figure, if ZRPS = 25°, the value of ZROS is



(A) 135°

(B) 145°

(C) 165°

(D) 155°

24. A tangent is drawn from a point at a distance of 17 cm of circle C(0, r) of radius 8 cm. The length of its tangent is

(A) 5 cm

(B) 9 cm

(C) 15 cm

(D) 23 cm

25. To draw a pair of tangents to a circle which are inclined to each other at an angle of 35°, it is required to draw tangents at the end-points of those two radii of the circle, the angle between which is

(A) 145°

(B) 130°

(C) 135°

(D) 90°

HOTS (High Order thinking Skill)

26. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages of the son and the father are, respectively

(A) 4 and 24 (B) 5 and 30

(C) 6 and 36 (D) 3 and 24

27. 27. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is

(A) 27 (B) 72

(C) 45 (D) 36

28. The equation $12x^2 + 4kx + 3 = 0$ has real and equal roots, if

(A) $k = \pm 3$ (B) $k = \pm 9$

(C) $k = 4$ (D) $k = \pm 2$

29. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$, then

(A) $p = 3$ (B) $p = 5$

(C) $p = 7$ (D) $p = 1$

30. The sum of all odd integers between 2 and 100 divisible by 3 is

(A) 17 (B) 867

(C) 876 (D) 786

31. If the numbers a, b, c, d, e form an A.P., then the value of $a - 4b + 6c - 4d + e$ is

(A) 0 (B) 1

(C) -1 (D) 2

32. The absccissa of the point of intersection of the less than type and of the more than type cumulative frequency curves of a grouped data gives its

(A) Mean (B) Median

(C) Mode (D) None of these

33. For the following distribution the sum of lower limits of the modal class and the median class is

C.I.	0-10	10-20
F	20	30

(A) 20 (B) 30 (C) 40 (D) 50

34. The letters of the word SOCIETY are placed at random in a row. The probability of getting a vowel is -

(A) 1/7 (B) 2/7 (C) 3/7 (D) 4/7

35. The length of the minute hand of a clock is 14 cm. The area swept by the minute hand in 5 minutes is -

(A) 153.9 cm^2 (B) 102.6 cm^2

(C) 51.3 cm^2 (D) 205.2 cm^2

REASONING AND MENTAL ABILITY

36. 3, 10, 101, ?

(A) 10101 (B) 10201

(C) 10202 (D) 11012

37. 0, 2, 8, 14, ?, 34

(A) 20 (B) 23 (C) 24 (D) 25

38. Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy ?

(A) Brother (B) Uncle (C) Cousin (D) Father

39. If A + B means A is the brother of B; A - B means A is the sister of B and A x B means A is the father of B. Which of the following means that C is the son of M?

(A) M - N x C + F (B) F - C + N x M

(C) N + M - F x C (D) M x N - C + F

40. One morning Udai and Vishal were talking to each other face to face at a crossing. If Vishal's shadow was exactly to the left of Udai, which direction was Udai facing ?

(A) East (B) West

(C) North (D) South

41. If South-East becomes North, North-East becomes West and so on. What will West become?

(A) North - East (B) North - West

(C) South - East (D) South - West

42. In a code language 35796 is written as 44887. Find the code for 46823.

(A) 55914 (B) 57194

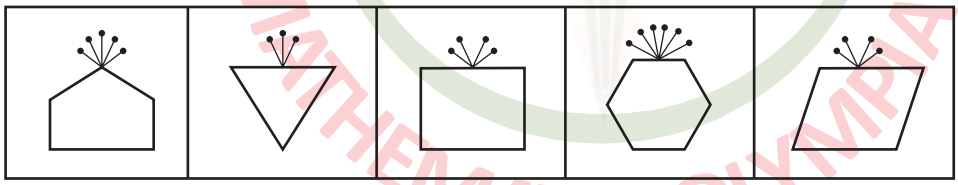
(C) 55934 (D) 55745

43. If LIGHT is coded as GILTH, find the code for RAINY.

(A) IARYN (B) ARINY

(C) NAIRY (D) RINAY

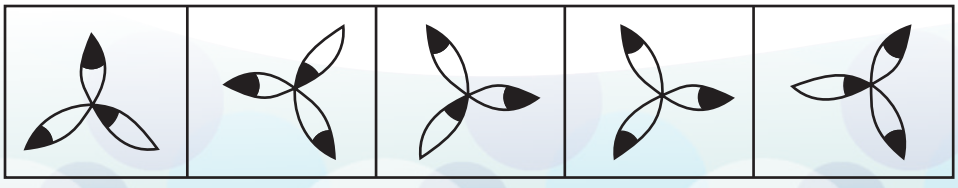
44. Choose the figure which is different from the rest.



(1) (2) (3) (4) (5)

(A) 1 (B) 2 (C) 3 (D) 4

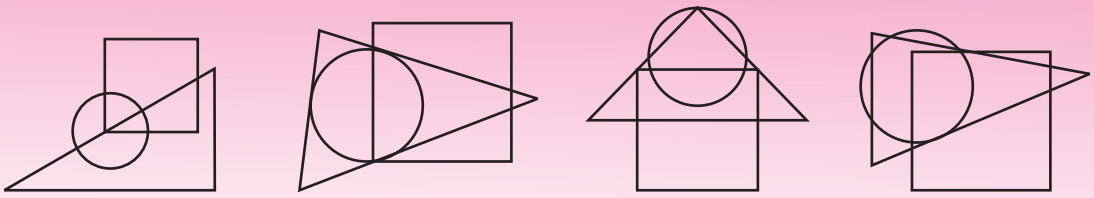
45. Choose the figure which is different from the rest.



(1) (2) (3) (4) (5)

(A) 1 (B) 2 (C) 3 (D) 4

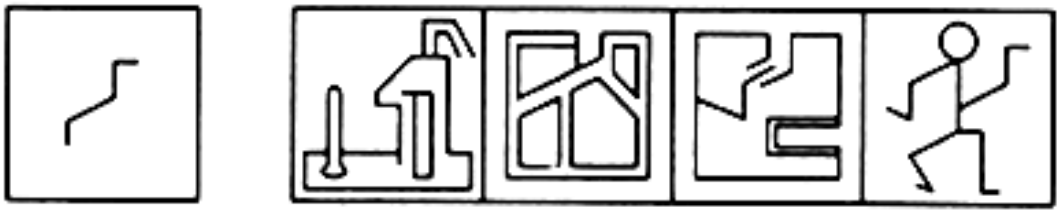
46. Select the figure which satisfies the same conditions of placement of the dots as in Figure-X.



(1) (2) (3) (4)

(A) 1 (B) 2 (C) 3 (D) 4

47. Find out the alternative figure which contains figure (X) as its part.



(A) 1 (B) 2 (C) 3 (D) 4

48. Choose the word which is different from the rest.

(A) Kiwi (B) Eagle

(C) Emu (D) Ostrich

49. If + stands for 'division', × stands for 'addition', – stands for 'multiplication' and ÷ stands for subtraction, then which of the following equations is correct ?

(A) 36 × 6 + 7 ÷ 2 – 6 = 20 (B) 36 + 6 – 3 × 5 ÷ 3 = 24

(C) 36 ÷ 6 + 3 × 5 – 3 = 45 (D) 36 -6 + 3 × 5 ÷ 3 = 74

50. If P denotes '+', Q denotes '–', R denotes '×' and S denotes '÷', then which of the following statement is correct ?

(A) 16 R 12 P 49 S 7 Q 9 = 200 (B) 32 S 8 R 9 = 160 Q 12 R 12

(C) 8 R 8 P 8 S 8 Q 8 = 57 (D) 36 R 4 S 8 Q 7 P 4 = 10

ANSWER KEY

1.	B	11.	D	21.	D	31.	A	41.	C
2.	B	12.		22.	D	32.	B	42.	A
3.	C	13.	D	23.	D	33.	D	43.	A
4.	D	14.	D	24.	C	34.	C	44.	A
5.	A	15.	D	25.	A	35.	C	45.	D
6.	B	16.	D	26.	C	36.	C	46.	D
7.	A	17.	A	27.	D	37.	C	47.	D
8.	D	18.	D	28.	A	38.	D	48.	B
9.	C	19.	C	29.	C	39.	D	49.	D
10.	B	20.	A	30.	B	40.	C	50.	C