

SUBJECT: MATHEMATICS

CLASS 10TH

TIME: 3 HOURS

MAX MARKS: 80

General Instructions:

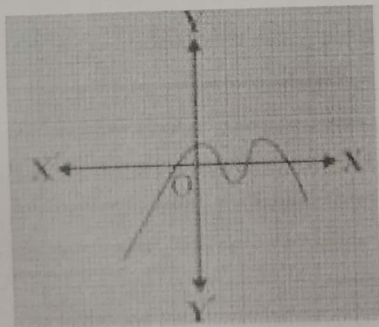
- i. This question paper comprises of four sections A, B, C & D and carries 40 questions of 80 marks. All questions are compulsory.
- ii. Section-A-Q No.1 to Q 20 comprises of 20 questions of one mark each.
- iii. Section-B-Q No.21 to Q 26 comprises of 6 questions of two marks each.
- iv. Section-C-Q No.27 to Q 34 comprises of 8 questions of three marks each.
- v. Section-D-Q No.35 to Q 40 comprises of 6 questions of four marks each.
- vi. There is no overall choice in the question paper. However, choice has been provided in 2 questions of one mark, 2 questions of two marks, 2 questions of three marks and 4 questions of four marks. Student has to attempt only one of the choice in such questions.

SECTION-A

1. The number $1 - \sqrt{3}$ is:

- (A) an even number (B) an irrational number (C) odd number (D) a rational number

2. Graph of a polynomial is given below:



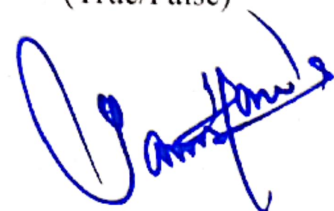
Number of zeros of polynomial are:

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

3. The pair of linear equations $2x - y + 9 = 0$ and $6x - 3y + 10 = 0$ are:

- (A) parallel (B) intersecting (C) coincident (D) none

4. 30th term of the AP: 10, 7, 4, ... is
 (A) 97 (B) 77 (C) -77 (D) -87
5. $\sin^2(25^\circ) + \cos^2(25^\circ)$ is equal to
 (A) $\sin(30^\circ)$ (B) $\sin(90^\circ)$ (C) $\cos(90^\circ)$ (D) $\sin(0^\circ)$
6. The abscissa of any point on y-axis is
 (A) 0 (B) 1 (C) -1 (D) none
7. HCF (0, 2) is
 (A) 0 (B) 2 (C) not possible to find (D) none
8. Getting a natural number greater than zero is an example of
 (A) impossible event (B) sure event (C) simple event (D) none
9. Three times volume of right circular cone of given height (h) and radius r is equal to:
 (A) twice volume of cylinder of height h and radius r (B) volume of cylinder of height h and radius r
 (C) half of volume of cylinder of height h and radius r (D) none
10. Which of the following is quadratic equation
 (A) $1+x^2+\sqrt{x}=0$ (B) $(x-1)^2=(x-2)^2$ (C) $(x-1)(x-2)=x^2+2$ (D) $x^2+2=5$
11. Prime factorization of 1001 is 7.11.13 (True/False)
12. The sum of first n natural numbers is _____
13. If $P(A)=\frac{1}{2}$ then $P(\text{not } A)=\frac{1}{2}$ (True/False)
14. All _____ triangles are similar.
15. A circle can have _____ parallel tangents at the most.
16. Write formula for sum to n terms of an AP.
17. $\sqrt{2}x + \sqrt{3}y = 4$ is an example of linear equation in two variables. (True/False)



18. $\sin(30^\circ) + \cos(60^\circ)$ is equal to $\tan(45^\circ)$.

(True/False)

OR

If $\sin A = \cos A$, where A is acute angle, then angle A is _____

19. Calculate mean of first 10 natural numbers.

20. Write the formula for Mean of Grouped data.

OR

Mode of observations 4, 2, 9, 2, 1, 3, 2, 5, 2 is _____

SECTION-B

21. Solve by substitution method

$$\sqrt{2}x + \sqrt{3}y = 0 \text{ and } \sqrt{3}x - \sqrt{8}y = 0$$

22. Find discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$ and hence nature of roots.

23. Given $15\cot A = 8$, find $\sec A$.

24. Find volume of hemisphere of radius 2cm.

OR

Calculate volume of cylinder of radius 1 cm and height 1 cm.

25. Find the point on the x-axis which is equidistant from $(2, -5)$ and $(-2, 9)$.

OR

Determine if the points $(1, 5)$, $(2, 3)$ and $(-2, -11)$ are collinear.

26. The sum and product of zeros of quadratic polynomial $x^2 - 15$ are?

SECTION-C

27. If A and B are $(-2, 2)$ and $(2, -4)$ respectively, find the coordinates of P such that $AP = \frac{3}{7} AB$ and P lies on the line segment AB .

28. Find the area of the sector of a circle with radius 4 cm and angle 30° . Also find the area of the corresponding major sector.

29. Prove that the tangent drawn at the ends of a diameter of a circle are parallel.

OR

Prove that the lengths of tangents drawn from an external point to a circle are equal.

30. Prove that if a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side.

31. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$

32. Prove that $3 + 2\sqrt{5}$ is irrational.

33. The 17th term of an AP exceeds its 10th term by 7. Find the common difference.

OR

Find the sum of first 22 terms of an AP in which $d=7$ and 22th term is 149.

34. A die is thrown once. Find the probability of getting

(a) a prime number (b) a number lying between 2 and 6

SECTION D

35. Is it possible to design a rectangular mango grove whose length is twice its breadth, and area is 800m^2 ? if so, find its length and breadth.

OR

Find two consecutive positive integers, the sum of whose squares is 365.

36. A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

OR

A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1 cm and the height of the cone is equal to its radius. Find the volume in terms of π .



37. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower.

38. If $\tan(A+B) = \sqrt{3}$ and $\tan(A-B) = \frac{1}{\sqrt{3}}$; $0^\circ < A+B \leq 90^\circ$; $A > B$, find A and B.

OR

Prove the identity $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$

39. State and prove Basic Proportionality theorem.

OR

The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{OA}{BO} = \frac{CO}{DO}$. show that ABCD is a trapezium.

40. The distribution below gives the weights of 3 students of a class. Find the median weight of the students

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
No. of students	2	3	8	6	6	3	2