BUDHA DAL PUBLIC SCHOOL PATIALA

PRE BOARD EXAMINATION (6 December 2025)

Class - X

Paper-Mathematics Standard (Set - A)

Time: 3hrs. **M.M. 80**

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

Section-A

1. If $a = 2^2 \times 3^x$, $b = 2^2 \times 3 \times 5$, $c = 2^2 \times 3 \times 7$ and $LCM\ (a, b, c) = 3780$ *then* x is equal to

   a) 1 b) 2 c) 3 d) 0

2. If roots of quadratic equation $4x^2 - 5x + k = 0$ are real and equal then value of k is

   a) $\frac{5}{4}$ b) $\frac{25}{16}$ c) $-\frac{5}{4}$ d) $-\frac{25}{16}$

3. The value of k for which the pair of linear equation $5x + 2y - 7 = 0$ *and* $2x + ky + 1 = 0$ do not have a solution is

   a) 5 b) $\frac{4}{5}$ c) $\frac{5}{4}$ d) $\frac{5}{2}$

4. If $k + 7$, $2k - 2$ *and* $2k + 6$ are three consecutive terms of an AP then value of k is

   a) 15 b) 17 c) 5 d) 1

5. If $\sec\theta - \tan\theta = m$ then value of $\sec\theta + \tan\theta$ is

   a) $1 - \frac{1}{m}$ b) $m^2 - 1$ c) $\frac{1}{m}$ d) $-m$

6. In $\Delta ABC, DE \parallel BC$ if $AE = (2x + 1)cm, EC = 4cm, AD = (x + 1)\ cm$ *and* $DB = 3cm$ then value of x is

   a) 1 b) $\frac{1}{2}$ c) -1 d) $\frac{1}{3}$

7. PQ is tangent to a circle centered at O. If the radius of the circle is 5cm and point P is at a distinct of $5\sqrt{3}\ cm$ from centre, then length of tangent PQ is

   a) $5\sqrt{2}\ cm$ b) $\frac{10}{\sqrt{3}}$ cm c) $10\ cm$ d) $\frac{5}{\sqrt{3}}\ cm$

A-1

8. Perimeter of sector of a circle whose central angle is 90^0 and radius 7cm is

a) 35 cm b) 11 cm c) 22 cm d) 25 cm

9. For what value of k the product of zeroes of polynomial $kx^2 - 4x - 7$ is 2?

a) $-\frac{1}{14}$ b) $-\frac{7}{2}$ c) $\frac{7}{2}$ d) $-\frac{2}{7}$

10. The point on $x - axis$ which is equidistant from the points $(5, -3)$ and $(4, 2)$ is

a) $(4.5, 0)$ b) $(7, 0)$ c) $(0.5, 0)$ d) $(-7, 0)$

11. In a right triangle ABC, right angled at A. If $sin\ B = \frac{1}{4}$ then value of sec $B$is

a) 4 b) $\frac{\sqrt{15}}{4}$ c) $\sqrt{15}$ d) $\frac{4}{\sqrt{15}}$

12. Consider the frequency distribution of 45 observations

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	9	15	10	6

The upper limit of median class is

a) 20 b) 10 c) 30 d) 40

13. A pair of irrational numbers whose product is a rational number is

a) $(\sqrt{16}, \sqrt{4})$ b) $(\sqrt{5}, \sqrt{2})$ c) $(\sqrt{3}, \sqrt{27})$ d) $(\sqrt{36}, \sqrt{2})$

14. The origin divides the line segment AB joining the points $A(1, -3)$ and B $(-3, 9)$ in the ratio

a) 3:1 b) 1:3 c) 2:3 d) 1:1

15. If height of a tower is equal to the length of shadow then angle of elevation of sun is.

a) 30^0 b) 45^0 c) 60^0 d) 90^0

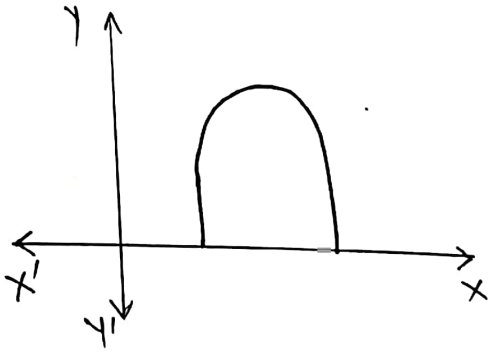
16. If the given figure shows the graph of polynomial $y = ax^2 + bx + c$ then

a) $a < 0$

b) $b^2 < 4ac$

c) a & b are of same sign

d) $c > 0$



17. Two coins are tossed simultaneously. The probability of getting atmost one tail is

a) $\frac{1}{2}$ b) $\frac{1}{4}$ c) $\frac{3}{4}$ d) 1

A - 2

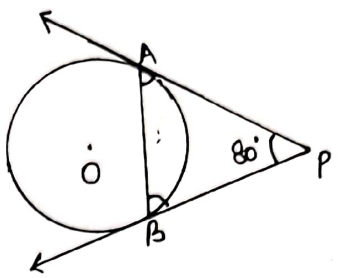
18. In given figure tangents PA and PB drawn from P to circle are inclined to each other at an angle of 80°. The measure of ∠PAB is

a) 80^0

b) 60^0

c) 50^0

d) 40^0



19. Statement A (Assertion) : If probability of an event is 0.7 then probability of its non occurance is 0.3

Statement R (Reason) : For an event A, $P(A) + P(not\ A) = 1$

a) Both A and R are true and Reason (R) is correct explanation of A

b) Both A and R are true but Reason (R) is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

20. Statement A (Assertion) : If circumference of a circle is 176cm then its radius is 28 cm.

Statement R (Reason) : Circumference = $2\pi \times$ radius of circle

a) Both A and R are true and Reason (R) is correct explanation of A

b) Both A and R are true but Reason (R) is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

Section – B

21. If α *and* β are the zeroes of polynomial $x^2 - 7x + k$ such that $\alpha - \beta = 1$ then find k

OR

Find a quadratic polynomial in x whose one zero is 3 and sum of zeroes is 0.

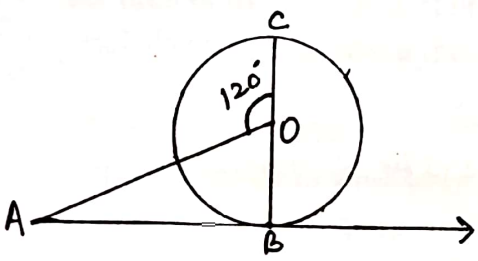
22. Which term of AP 3, 15, 27, 39 . . . . . will be 120 more than its 21st term?

23. Find value of k for which the root of quadratic equation $5x^2 - 10x + k$ are real and equal. Also find the roots.

24. Prove the following identity

$$\frac{\sin A - \cos A + 1}{\sin A + \cos A - 1} = \sec A + \tan A$$

25. If AB is a tangent drawn from a point A to a circle with centre O and BOC is a diameter of the circle. Such that $\angle AOC = 120^0$ *then find* $\angle OAB$



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Section – C

26. The traffic lights at three different road crossings change after every 48 sec, 72 sec, 108 sec respectively if they change simultaneously at 7am at what time will they change together next.

27. Solve the following pair of equations by Elimination Method :

$$\frac{x}{3}+\frac{y}{3}=14$$
$$\frac{5x}{6}-\frac{y}{3}+7=0$$

28. In what ratio does the $x-axis$ divides the line segment joining the points $(2,-3)$ and $(5,6)$. Also find the co-ordinates of the point of intersection.

29. From a point of the ground the angles of elevation of the bottom and top of a transmission tower fixed at the top of a 20m high building are 45^0 and 60^0 respectively. Find height of the tower.

30. Prove that the parallelogram circumscribing a circle is a rhombus.

31. A chord of a circle of radius 10cm subtends a right angle at centre. Find ($\pi = 3.14$)
    a) Area of corresponding sector
    b) Area of corresponding segment

Section – D

32. A shopkeeper buys a number of books for Rs. 80. If he had bought 4 more books for the same amount, each book would have cost Re. 1 less. How many books did be buy?

OR

At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha.

33. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio. Prove that the line joining the mid-points of any two sides of a triangle is parallel to the third side.

34. A box contains cards bearing numbers from 6 to 70. If a card is drawn at random from the box then find the probability that it bears
    a) A one digit number
    b) A number divisible by 5
    c) An odd number less than 30
    d) A composite number between 50 and 70

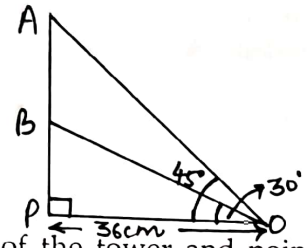
35. In the following distribution mean of distribution is 86. Find p if

Wages (in Rs.)	50-60	60-70	70-80	80-90	90-100	100-110
No. of workers	5	3	4	p	2	13

Section - E

Case Study :

36. Radio towers are used for transmitting a range of communication services including radio and television. The tower will either act as an antenna itself or support one or more antennas on its structure. On a similar concept, a radio station tower was built in two Sections A and B. Tower is supported by wires from a point O.



Distance between the base of the tower and point O is 36 cm. From point O, the angle of elevation of the top of the Section B is 30^0 and the angle of elevation of the top of Section A is 45^0.

Based on the above information, answer the following questions:

a) Find the length of the wire from the point O to the top of Section B.

b) Find the distance AB.

c) (a) Find the height of the Section A and base of the tower.

OR

(b) Find the area of ΔOPB

37. Metallic silos are used by farmers for storing grains. Farmer Girdhar has decided to build a new metallic silo to store his harvested grains. It is in the shape of a cylinder mounted by a cone. Dimensions of the conical part of a silo is as follows.

Radius of base = 1.5 m

Height = 2 m

Dimensions of the cylindrical part of a silo is as follow:

Radius of base = 1.5 m

Height = 7 m

On the basis of the above information, answer the following questions:

a) Calculate the slant height of the conical part of one silo.

b) Find the curved surface area of the conical part of one silo.

c) (a) Find the cost of metal sheet used to make the curved cylindrical part of 1 silo at the rate of Rs. 2000 per m^2.

OR

(b) Find the total capacity of one silo to store grains.

A-5