

# Sample Question Paper –I Mathematics

Class – X 2007

Time 3 Hours

Maximum Marks: 80

General Instructions:

1. All Questions are compulsory.
2. The question paper consists of 25 questions divided into three sections; A, B, and C. Section A contains 7 questions of 2 marks each, section B is of 11 questions of 3 marks each and section C is of 6 questions of 5 marks each.
3. Internal choices have been provided in some questions. You have to attempt only one of the choices in such questions.
4. Write the serial number of the question before attempting it.
5. In question on construction the drawing should be neat and exactly as per the given measurements.
6. Use of calculator is not permitted. However you may ask for mathematical table.

## Section 'A' {Question number 1 to 7 carry 2 marks each.}

1. Find **a** and **b** so that the polynomial

$P(x) = (x^2+3x+2)(x^2+2x+a)$  And  $q(x) = (x^2+7x+12)(x^2+7x+b)$  may have  $(x+1)(x+3)$  as their HCF

2. Express in lowest terms:

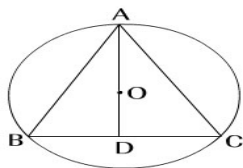
$$\frac{x^4 - 6x^3 + 36x^2}{x^3 + 216}$$

3. Show that **a – b**, **a**, and **a + b** form consecutive terms of **AP** OR Simplify  $\frac{2}{x^2 - x - 6} +$

$$\frac{3}{x^2 + x - 2} + \frac{4}{x^2 - 4x + 3}$$

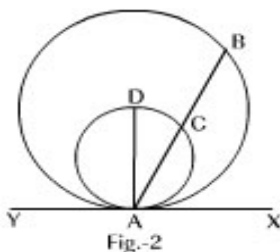
4. Find the value of **p** for which the given quadratic equation has real roots

a.  $Px^2 + 4x + 1 = 0$     b.  $2x^2 + 3x + p = 0$



5. Fig-1 Bisector **AD** of  $\angle BAC$  of  $\triangle ABC$  passes through the centre **O** of the circum circle of  $\triangle ABC$ . Prove that **AB = AC**

6. Given a circle with centre **O**. Another circle is drawn passing through **O** and touching the given circle at a given point **A**. **AB** is a chord of the larger circle at a point **C** (fig – 2). Prove That **AC = CB**.



7. **PQ** and **RS** are two parallel tangents to a circle with centre **O** and another tangent **XY**, with point of contact **C** intersects **PQ** at **A** and **RS** at **B**. Prove that

$$\angle AOB = 90^\circ.$$

### Section 'B'

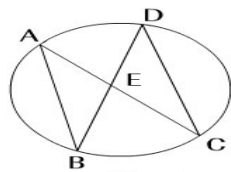


Fig.-4

8. In fig 4,  $AB = CD$ . Prove  $BE = DE$  and  $AC = CE$ , Where  $E$  is the point of intersection of  $AD$  and  $BC$ .
9. A pressure cooker is sold for **Rs 500** cash or 250 cash down payment. Followed by **Rs 260** after three months. Find the rate of interest charged under this scheme.
10. A sum of **Rs 10815** is to be paid back in **3** equal half yearly installments. If the interest is compounded half yearly at the rate of  $13\frac{1}{3}\%$  per annum, find each installment.
11. Draw the graphs of  $4x - y = 4$  and  $4x + y = 12$  Determine the vertices of the triangle formed by the lines representing these equation and the  $x - axis$ . Shade the triangular region so formed.
12. A motor Boat, whose speed is **9 km/h** in still water goes **12 km** downstream and comes back in a total time of **3 hours**, Find the speed of the stream.
13. Construct a triangle ABC in which  $BC = 3.5$  cm, angle  $B = 60^\circ$  and  $AC = 2.5$  cm and draw its circumcircle.
14. Water in a canal, 30 dm wide and 12 dm deep is flowing with a velocity of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is required for irrigation?
15. Prove the identities:  $\frac{1 + \cos A}{\sin A} + \frac{\sin A}{1 + \cos A} = \frac{2}{\sin A}$  (b) Evaluate:  $\left(\frac{\sin 27^\circ}{\cos 63^\circ}\right)^2 + \left(\frac{\cos 63^\circ}{\sin 27^\circ}\right)$
16. Find the point on X – axis which is equidistant from (-2, 5) and (2, -3). **OR** Check whether the points (20, 3), (19, 8) and (2, -9) are all equidistant from the point (7, 3).
17. Show that the mid point of the line segment joining the points (5, 7) and (3, 9) is also the mid point of the line segment joining the points (8, 6), (0, 10).
18. In the month of July, 2006, a householder spent his monthly salary amounting to Rs. 7200 on:
- | Item                  | Clothing | Food | House Rent | Education | Miscellaneous |
|-----------------------|----------|------|------------|-----------|---------------|
| Amount Spent (In Rs.) | 600      | 4000 | 1200       | 400       | 1000          |
- Represent the information in the form of pie chart.
19. A card is drawn from a well shuffle deck of playing cards. Find out the probability of drawing  
 a. A face card    b. A red face card
- Section 'C'** {Question number 20 to 25 carry 5 marks each.}
20. The following table shows marks secured by 140 students in an examination, Calculate mean marks step-deviation method

Marks	0 – 10	11 – 20	21 – 30	31 – 40	41 - 50
Amount Spent (In Rs.)	600	4000	1200	400	1000

- 21.** A two-digit number is obtained by either multiplying the sum of their digits by 8 and adding 1 or by multiplying the difference of the digits by 13 and adding 2. Find the number. How many such numbers are there?
- 22.** Aslam's salary is Rs 26,000 per month. He contributes Rs 54,000 towards GPF and PPF during the year. He also purchases NSC's worth Rs 16,000. He donates Rs 8,000 to a charitable trust, thus earning a deduction of 50% on the donation. Calculate income tax to be paid by him.
- 23.** Prove that if a line is drawn parallel to one side of a triangle, to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. ABCD is a trapezium such that  $AB \parallel CD$ . Its diagonals AC and BD intersect each other at O. On the bases of above theorem prove that  $\frac{AD}{OC} = \frac{BO}{OD}$
- 24.** The horizontal distance between two towers is 140 m. The angle of elevation of the top of the first tower when seen from the top of the second tower is  $30^\circ$ . If height of second tower is 60 m, find the height of the first tower.
- 25.** If the radii of the ends of a bucket 45 cm high are 28 cm and 7 cm, determine the capacity and surface area.