

Sample Papers – 2007
Mathematics
CLASS - X

➤ **GENERAL INSTRUCTIONS:**

- All questions are compulsory.
- The question paper consists of 25 questions divided in to three sections-A, B and C. section A contains 7 questions of 2 marks each. Section B is of 12 questions of 3 marks each and section C is of 6 questions of 5 marks each.
- There is no overall choice. However internal choice has been provided in two questions of two marks each, two questions of three marks each and two questions of five marks each.
- In question on theorems, the drawing should be neat and exactly as per the given measurements.
- Use of calculator is not permitted.

SECTION-A

1) Solve

$$b(a-b)x - a(b-a)y = a^2 - b^2$$
$$ax\left[\frac{1}{a-b} - \frac{1}{a+b}\right] + by\left[\frac{1}{b-a} - \frac{1}{b+a}\right] = 2$$

- 2) If 5th term and 12th term of an A.P are -4 and -18 respectively. Find the 15th term and nth term of an A.P
- 3) The sum of the first six terms of an AP is zero and its fourth term is 2. Find the sum of its first 30 terms.

Or

Find the sum all multiples of 9 lying between 300 and 800

- 4) Kamal borrowed a sum of money and returned it in three equal quarterly instalments of Rs.8788 each. Find the sum borrowed if the rate of interest charged was 16 % per annum compounded quarterly. Find the total interest charged also.
- 5) BL and CM are the medians of triangle ABC right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$
- 6) Show that the quadrilateral formed by an angle bisector of a cyclic quadrilateral is also cyclic.
- 7) A bag contains 5 red balls 4 white balls 8 green balls and 7 black balls. if one ball is drawn at random, find the probability that it is (i) not a black ball.
(ii) red or green ball.

Or

Out of a packet of 52 playing cards two black kings and 4 red cards were lost. From the remaining pack, a card is drawn at random. Find the probability that the card drawn is (i) a red card
queen (ii) a black

SECTION.B

8) Solve the following system of equations graphically.

$$4x - 3y + 4 = 0, 4x + 3y - 20 = 0$$

Also

determine the ordered pairs where the line cut the x axis. Hence determine the area of a triangular region so formed by these lines with x axis.

9) If $(x^2 - x - 2)$ is the HCF of the polynomials $(x+1)(2x^2 + ax+2)$ and $(x-2)(3x^2 + bx+1)$. Find the value of a and b.

10) If $P = \frac{x^4 - 8x}{x^3 - x^2 - 2x}$, $Q = \frac{x^2 + 2x + 1}{x^2 - 4x - 5}$ and $R = \frac{2x^2 + 4x + 8}{x - 5}$

Find the value of $(P \times Q) \div R$.

11) Find the centre of a circle passing through the points $(5,7)$, $(6,6)$ and $(2,-2)$. Also find the radius.

12) A ceiling fan is available for Rs.970 cash or for Rs.210 cash down payment followed by 3 equal installments of Rs.260 each. Find the rate of interest charged under installment plan

13) A cylindrical tub of radius 12cm contains water to a depth of 20 cm. A spherical iron ball is dropped into the tub which rises the level of water in the tub by 6.75 cm. Find the radius of the spherical ball.

14) If $7\operatorname{cosec}\theta - 3\cot\theta = 7$, prove that $7\cot\theta - 3\operatorname{cosec}\theta = 3$

or

Without using trigonometric table, evaluate

$$\frac{\sin 39^\circ}{\cos 51^\circ} + 2 \tan 11^\circ \cdot \tan 31^\circ \cdot \tan 45^\circ \cdot \tan 59^\circ \cdot \tan 79^\circ - 3(\sin^2 21^\circ + \sin^2 69^\circ)$$

15) Construct a quadrilateral with $AB=6$ cm, $AD=4$ cm, $BD=4.5$ cm, $\angle B=120^\circ$ and $BC=5$ cm. Construct a quadrilateral with its sides $\frac{7}{5}$ th of the corresponding sides ABCD.

16) Find the ratio in which the line $x - y - 2 = 0$ divides the line segment joining the points $(3,-1)$, $(8,9)$. Find the coordinate of that point also.

17) If PQ and RS are the parallel tangents to a circle with centre O and another tangent XY with point of contact C intersect PQ at A and RS at B. Prove that $\angle AOB = 90^\circ$

18) If $(3,2)$, $(4,4)$ and $(1,3)$ are the mid point of the sides of a triangle, find the coordinates of the vertices of the triangle.

19) The number of students in a hostel speaking different languages is given below. Present data in a pie chart.

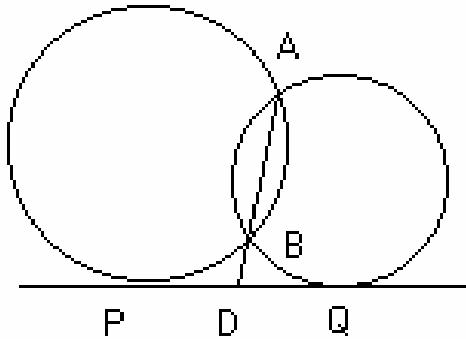
language	No. of students
Hindi	40
English	12
Marathi	9
Tamil	7
Bengali	4
Total	72

SECTION.C

20) Mohan has a monthly income of Rs.27000.(exclusive of HRA).He contributes 7500 per month towards his CPF and pays an amount of Rs.4000 quarterly towards his LIC premium. He invests Rs.5000 in N.S.C's. He donates Rs.10000 towards PM's relief fund earns 100% deduction and he also donates Rs 8000 (earns 50% deduction)towards a charitable trust.If he pays Rs 1500 as income tax per month for the last 11 months. Find his tax liability for the last month of the financial year

For male persons (below 65 yrs)	
TAXABLE INCOME	INCOME TAX
Upto Rs. 100000	NIL
Rs. 1lac to Rs. 1.5 lac	10% of income exceeding Rs. 1 lac
Rs. 1.5 lac to Rs. 2.5 lac	Rs. 5000 + 20% of income exceeding Rs. 1.5 lac

21) If PAB is a secant to a circle intersecting the circle at A and B and PT is a tangent to the circle at T then prove that $PT^2 = PA \cdot PB$ Using above result Prove $DP = DQ$

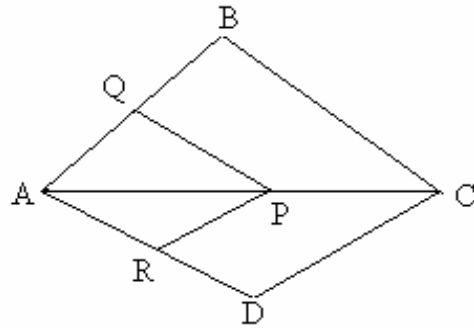


22) Prove that “the sum of either pair of the opposite angles of a cyclic quadrilateral is 180° ”

using the above result prove that “a cyclic parallelogram is a rectangle”

Or

Prove that “In a triangle a line drawn parallel to one side to intersect the other sides in distinct points ,divides the two sides in the same ratio”. In the figure If PQ parallel to BC and PR parallel to CD , Prove that $AR/RD=AQ/BQ$



23) A bucket , made of aluminium sheet, is of height 20cm and its upper and lower ends of radius 36cm and 12 cm respectively.find the cost of preparing the bucket if the aluminium sheet costs Rs 50 per 100 sq.m.Also find its volume.

24) A bird is sitting on the top of a tree, which is 80m high. The angle of elevation of the bird, from a point on the ground is 45. The bird flies away from the point of the observation horizontally and remains at a constant height. After 2 seconds, the angle of elevation of the bird from the point of observation becomes 30. Find the speed of the flying of the bird.

25) The total number of marks scored by class in test is given below. find the mean

Below 20	4
Below 40	12
Below 60	30
Below 80	44
Below 100	50