Maharashtra State Board

Class X Maths Algebra

Question Paper Set-1

Time : 2 Hours **Marks 40**

Notes :

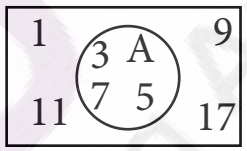
(i) All questions are compulsory.

(ii) Use of calculator is not allowed.

(iii) Total marks are shown on the right side of the question.

Q. 1 (A) Solve **any four** of the following. 4

(1) Observe the adjacent Venn diagram and write the complement of A.



(2) Multiply : $2\sqrt{12} \times \sqrt{3}$

(3) Find the geometric mean of 4 and 25.

(4) Find x if $x + y = 5$, and $x - y = 7$

(5) The estimated tax on the income of Shreemati Hinduja is Rs. 8000. How much education cess has she to pay at 3% ?

(6) Find the class-mark of 80-90.

(B) Solve **any two** of the following. 4

(1) Factorise : $m^2 + 5x + 6$.

(2) The sum of two natural numbers is 20 while their difference is 4. Find the numbers.

(3) In $\square$PQRS, $\angle$ R = 60°. Find the ratio $\angle$ R : $\angle$ Q

Q. 2 (A) Choose the correct alternative answer and write. 4

(1) For a simultaneous equation in x and y, if Dx = 25, Dy = 50 and D = 5, What is the value of x ?

(A) -5 (B) $\frac{1}{5}$ (C) 10 (D) 5

(2) Which of the following is a quadratic equation ?

(A) $6x^2 = 20 - x^3$ (B) $x^2\left(\frac{1}{x} - 2\right) = \frac{7}{2}$

(C) $\frac{3}{x} - 3 = 4x^2$ (D) $5x + 7 = 3x$

(3) If in an A. P., d = 10, find $t_6 - t_2$.

(4) The rate of GST on stainless steel is 18%, of which the share of a state government is .....

(A) 18% (B) 9% (C) 36%

(B) Solve any two of the following. 4

(1) Two coins are tossed simultaneously. Find the probability of getting at least one head.

(2) If the roots of $2x^2 - 6x + k = 0$ are real and equal, find k.

(3) Solve the following simultaneous equations.

$101x + 99y = 501$, $99x + 101y = 499$

Q. 3 (A) Solve **any two** of the following. 4

(1) The first term of an A. P. is 5 and the common difference is 4. Complete the following activity and find the sum of the first 12 terms of the A. P.

$a = 5$, $d = 4$, $s_{12} = ?$

$s_n = \frac{n}{2}[\square]$

$s_{12} = \frac{12}{2}[10 + \square]$

$= 6 \times \square$

$= \square$

(2) Complete the following activity to solve the simultaneous equations $3x + 2y = 6$ and $2x + 4y = 12$ by cramer's method.

$D = \begin{vmatrix} 3 & 2 \\ 2 & 4 \end{vmatrix} = 8$ $Dx = \begin{vmatrix} 6 & 2 \\ 12 & 4 \end{vmatrix} = \square$, $Dy = \begin{vmatrix} 3 & 6 \\ 2 & 12 \end{vmatrix} = \square$

$x = \square$ $y = \square$

(3) The six faces of a die are marked

The event M is getting a vowel on the upper face of the die when it is tossed. Complete the following activity and find the probability of the event.

S = {☐}

n(S) = ☐

M = {☐}

n(M) = ☐

P(M) = $\frac{\square}{\square}$ = ☐

(B) Solve **any two** of the following. 4

(1) The following table shows the percentages of vehicles passing a signal. Find out the measures of central angle to show the information by a pie diagram and hence draw the pie diagram.

Type of Vehicle	Bicycle	Two wheeler	Car	Bus	Rickshaw
Percentage	10	30	20	20	20

(2) Mr. Mahajan purchased 100 shares, each of face value Rs. 100, when the market price was Rs. 45 per share, paying 2% brokerage. If the rate of GST on the brokerage is 18%, find the total amount he spent.

(3) There are 25 rows of seats in an auditorium. The first row is of 20 seats, the second of 22 seats, the third of 24 seats, and so on. How many chairs are there in the 21st row ?

Q 4. Solve **any three** of the following. 9

(1) Solve : $7y = -3y^2 - 4$

(2) In a game of chance, the spinning arrow rests at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8. All these are equally likely outcomes. Find the probabilities of the following events.

(A) The arrow rests at an odd number.

(B) It rests at a prime number.

(C) It rests at a multiple of 2.

(3) Find out the sum of all natural numbers between 1 and 145 which are divisible by 4.

(4) The following frequency distribution table shows the number of mango trees in a grove and their yield of mangoes, and also the cumulative frequencies. Find the median of the data.

Class (No. of mangoes)	Frequency (No. of trees)	Cumulative frequency (less than)
50-100	33	33
100-150	30	63
150-200	90	153
200-250	80	233
250-300	17	250

Q 5. Solve **any three** of the following. 4

(1) Six year before, the age of mother was equal to the square of her son's age. Three year hence, her age will be thrice the age of her son then. Find the present ages of the mother and son.

(2) Draw a frequency polygon from the information given in the following table.

Age of blood donar (Years)	No. of blood donars
Less than 20	0
Less than 25	30
Less than 30	75
Less than 35	127
Less than 40	165
Less than 45	185
Less than 50	197

Q 6. Solve **any one** of the following. 3

(1) Draw the graph of $x + y = 6$ which intersects the X-axis and the Y-axis at A and B respectively. Find the length of seg AB. Also, find the area of Δ AOB where point O is the origin.

(2) The market value of a mutual fund is 400 crore rupees. Which is divided into 8 crore units.

(a) Suppose you invest Rs. 10,000 in the units, how many units will you get ?

(b) While selling the units if their market value is increased by 10%, how much amount will you get by selling them ?