



ALGEBRA

Class 10 - Mathematics - I

Time Allowed: 2 hours

Maximum Marks: 40

General Instructions:

1. All questions are compulsory.
2. Use of a calculator is not allowed.
3. The numbers to the right of the questions indicate full marks.
4. In case of MCQs Q. No. 1(A) only the first attempt will be evaluated and will be given credit.

1. [8]
- (a) **Choose the correct alternative from given :**
- i. From the following equations, which one is the quadratic equation? [1]
- a) $\frac{5}{x} - 3 = x^2$ b) $\frac{1}{x^2}(x + 2) = x$
c) $n - 1 = 2n$ d) $x(x + 5) = 4$
- ii. To draw graph of $4x + 5y = 19$, what will be the value of y when $x = 1$: [1]
- a) 3 b) 4
c) -3 d) 2
- iii. For a given A.P. $a = 3.5$, $d = 0$, then $t_n =$ _____ [1]
- a) 0 b) 103.5
c) 3.5 d) 104.5
- iv. In the format of GSTIN, there are _____ alpha-numerals. [1]
- a) 9 b) 16
c) 10 d) 15
- (b)
- i. If $15x + 17y = 21$ and $17x + 15y = 11$, then find the value of $x + y$. [1]
- ii. Find first term of the sequence $t_n = 3n - 2$. [1]
- iii. On certain article if rate of CGST is 9%, then what is the rate of SGST and what is the rate of GST? [1]
- iv. If $n(A) = 2$, $P(A) = \frac{1}{5}$, then $n(S) = ?$ [0]
- a) 20 b) 5
c) 10 d) 2

2. [12]
- (a) **Complete the following activities and rewrite it (any two) :**
- i. Find the sum of first n even natural numbers. [2]

- ii. Solve the quadratic equation by factorisation method: $x^2 - 15x + 54 = 0$ [2]
 iii. Two coins are tossed simultaneously. Complete the following activity to write the sample [2]

space and the given events A and B in the set form:

Event A: To get at least one head.

Event B: To get no head.

Activity:

Two coins are tossed simultaneously.

\therefore Sample space is

$$S = \{\square, HT, TH, \square\}$$

Event A: To get at least one head.

$$\therefore A = \{\square, HT, TH\}$$

Event B: To get no head.

$$\therefore B = \{\square\}$$

(b) Solve the following subquestions (any four) :

- i. To solve the following simultaneous equations by Cramer's rule, find the values of D_x and D_y . [2]

$$3x + 5y = 26$$

$$x + 5y = 22$$

- ii. Complete the following activity to form a quadratic equation. [2]

I am a quadratic equation

↓

My standard form is

↓

My roots are 3 and 4.

↓

\therefore Sum of my roots =
 and product of my roots =

↓

\therefore My equation is

- iii. First term and common difference of an A.P. are 12 and 4 respectively. If $t_n = 96$, find n. [2]

- iv. Two coins are tossed simultaneously. Complete the following activity of writing the sample [2]

space (S) and expected outcomes of the events:

i. Event A : to get at least one head.

ii. Event B : to get no head.

Activity:

If two coins are tossed simultaneously

$$\therefore S = \{\square, HT, TH, \square\}$$

i. Event A : at least getting one head.

$$\therefore A = \{HH, \square, TH\}.$$

ii. Event B : to get no head.

$$B = \{\square\}$$

- v. Find the mean from the given values: [2]

$$\sum x_1 f_1 = 1265; N = 50$$

[9]

3.

(a) Complete the following activity and rewrite it (any one) :

- i. The frequency distribution table shows the number of mango trees in a grove and their yield of mangoes. Find the median of data: [3]

No. of Mangoes	No. of Trees
50 – 100	33
100 – 150	30
150 – 200	90
200 – 250	80
250 – 300	17

- ii. Shri Shantilal has purchased 150 shares of $FV ₹100$, for MV of ₹120, Company has paid dividend at 7%, then to find the rate of return on his investment, complete the following activity: [3]

$$FV = ₹100; \text{Number of shares} = 150$$

$$\text{Market value} = ₹120$$

i. Sum investment = $MV \times \text{No. of Shares}$

$$= \square \times \square$$

$$\therefore \text{Sum investment} = ₹18,000$$

ii. Dividend per share = $FV \times \text{Rate of dividend}$

$$= \square \times \frac{\square}{100} = ₹7$$

$$\text{Total dividend received} = 150 \times 7$$

$$= \square$$

iii. Rate of return = $\frac{\text{Dividend income}}{\text{Sum invested}} \times 100$

$$= \frac{1,050}{18,000} \times 100 = \square$$

(b) Solve the following subquestions (any two) :

- i. Solve the following quadratic equation by formula method: $3m^2 - m - 10 = 0$ [3]
- ii. Draw the graph of the equation $x + 2y = 4$. Find the area of the triangle formed by the line intersecting to X-axis and Y-axis. [3]
- iii. A readymade garment shopkeeper gives 5% discount on a dress of ₹ 2,000 and charges 5% GST on the remaining amount. What is the purchase price of the dress for the customer? [3]
- iv. A balloon vendor has 2 red, 3 blue and 4 green balloons. He wants to choose one of them at random to give it to Pranali. What is the probability of the event that Pranali gets: [3]
- a red balloon
 - a blue balloon
 - a green balloon.

4. Solve the following subquestions (any two) : [8]

- (a) A train travels 240 km with uniform speed. If the speed of the train is increased by 12 km/h , it takes one hour less to cover the same distance. Find the initial speed of the train. [4]

- (b) The following frequency distribution table shows marks obtained by 180 students in Mathematics examination: [4]

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Number of Students	25	x	30	$2x$	65

Find the value of x .

Also draw a histogram representing the above information.

- (c) In a **Mahila Bachat Gat** Kavita invested from the first day of month ₹ 20 on first day, ₹ 40 on second day and ₹60 on third day. If she saves like this, then what would be her total saving in the month of February 2020? [4]

5. Solve the following subquestions (any one) :

[3]

- (a) Show the following data by a frequency polygon:

[3]

Electricity bill (₹)	Families
200 – 400	240
400 – 600	300
600 – 800	450
800 – 1000	350
1000 – 1200	160

- (b) Solve the following simultaneous equations graphically: $x + y = 0$; $2x - y = 9$

[3]