

N 610

Seat No.

--	--	--	--	--	--

2019 III 11 1100 -N 610- MATHEMATICS (71) ALGEBRA—PART I (E)

(NEW COURSE)

Time : 2 Hours

(Pages 8)

Max. Marks : 40

Note :— (i) All questions are compulsory.

(ii) Use of calculator is not allowed.

(iii) Figures to the right of questions indicate full marks.

1. (A) Solve the following questions (Any four) : 4

(i) Find the median of :

66, 98, 54, 92, 87, 63, 72.

(ii) Multiply and write the answer in the simplest form :

$$5\sqrt{7} \times 2\sqrt{7}$$

(iii) If $3x + 5y = 9$ and $5x + 3y = 7$, then find the value of $x + y$.

(iv) Write the ratio of second quantity to first quantity in the reduced form :

5 dozen pens, 120 pens.

(v) Write the following polynomial in coefficient form :

$$2x^3 + x^2 - 3x + 4.$$

P.T.O.

2/N 610

- (vi) For computation of income tax which is the assessment year of financial year 01-04-2016 to 31-03-2017 ?

(B) Solve the following questions (Any two) : 4

- (i) Find the value of the polynomial $2x^3 + 2x$, when $x = -1$.
- (ii) If $A = \{11, 21, 31, 41\}$, $B = \{12, 22, 31, 32\}$, then find :
- (1) $A \cup B$
- (2) $A \cap B$.
- (iii) Sangeeta's monthly income is ₹ 25,000. She spent 90% of her income and donated 3% for socially useful causes. How much money did she save ?

2. (A) Choose the correct alternative : 4

- (i) In the A.P. 2, -2, -6, -10, common difference (d) is :
- (A) -4
- (B) 2
- (C) -2
- (D) 4

3/N 610

(ii) For the quadratic equation $x^2 + 10x - 7 = 0$, the values of a, b, c are :

(A) $a = -1, b = 10, c = 7$

(B) $a = 1, b = -10, c = -7$

(C) $a = 1, b = 10, c = -7$

(D) $a = 1, b = 10, c = 7$

(iii) The tax levied by Central Government for trading within a state is :

(A) IGST

(B) CGST

(C) SGST

(D) UTGST

(iv) If a die is rolled, what is the probability that number appearing on upper face is less than 2 ?

(A) $\frac{1}{3}$

(B) $\frac{1}{2}$

(C) 1

(D) $\frac{1}{6}$

P.T.O.

4/N 610

(B) Solve the following questions (Any two) :

4

(i) First term and common difference of an A.P. are 12 and 4 respectively. If $t_n = 96$, find n .

(ii) If $\begin{vmatrix} 4 & 5 \\ m & 3 \end{vmatrix} = 22$, then find the value of m .

(iii) Solve the following quadratic equation :

http://www.maharashtrastudy.com

$$x^2 + 8x + 15 = 0.$$

3. (A) Complete the following activities (Any two) :

4

(i) Smita has invested ₹ 12,000 to purchase shares of FV ₹ 10 at a premium of ₹ 2. Find the number of shares she purchased. Complete the given activity to get the answer.

Activity : FV = ₹ 10, Premium = ₹ 2

$$\therefore MV = FV + \boxed{} = \boxed{} + 2 = 12$$

$$\therefore \text{No. of shares} = \frac{\text{Total investment}}{MV}$$

$$= \frac{\boxed{}}{12} = \boxed{} \text{ shares}$$

5/N 610

- (ii) The following table shows the daily supply of electricity to different places in a town. To show the information by a pie diagram, measures of central angles of sectors are to be decided.

Complete the following activity to find the measures :

Places	Supply of electricity (Thousand units)	Measure of central angle
Roads	4	$\frac{4}{30} \times 360 = 48^\circ$
Factories	12	$\frac{\boxed{}}{\boxed{}} \times 360 = 144^\circ$
Shops	6	$\frac{6}{30} \times 360 = \boxed{}$
Houses	8	$\frac{\boxed{}}{\boxed{}} \times 360 = \boxed{}$
Total \Rightarrow	30	

- (iii) Two coins are tossed simultaneously. Complete the following activity of writing the sample space (S) and expected outcomes of the events :

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

(ii) Event B : to get no head.

P.T.O.

6/N 610

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.

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

(B) Solve the following questions (Any two)

4

(i) Find the 19th term of the A.P. 7, 13, 19, 25,

(ii) Obtain a quadratic equation whose roots are -3 and -7.

(iii) Two numbers differ by 3. The sum of the greater number and twice the smaller number is 15. Find the smaller number.

4. Solve the following questions (Any three) :

9

(i) Amit saves certain amount every month in a specific way. In the first month he saves ₹ 200, in the second month ₹ 250, in the third month ₹ 300 and so on. How much will be his total savings in 17 months ?

(ii) A two digit number is to be formed using the digits 0, 1, 2, 3. Repetition of the digits is allowed. Find the probability that a number so formed is a prime number.

7/N 610

- (iii) Smt. Malhotra purchased solar panels for the taxable value of ₹ 85,000. She sold them for ₹ 90,000. The rate of GST is 5%. Find the ITC of Smt. Malhotra. What is the amount of GST payable by her ?
- (iv) Solve the following simultaneous equations graphically :

$$x + y = 0; 2x - y = 9.$$

5. Solve the following questions (Any one) :

4

- (i) The following frequency distribution table shows marks obtained by 180 students in Mathematics examination :

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

Find the value of x .

Also draw a histogram representing the above information.

- (ii) Two taps together can fill a tank completely in $3\frac{1}{13}$ minutes. The smaller tap takes 3 minutes more than the bigger tap to fill the tank. How much time does each tap take to fill the tank completely ?

P.T.O.

8/N 610

6. Solve the following questions (Any one) :

3

- (i) The co-ordinates of the point of intersection of lines $ax + by = 9$ and $bx + ay = 5$ is $(3, -1)$. Find the values of a and b .
- (ii) The following frequency distribution table shows the distances travelled by some rickshaws in a day. Observe the table and answer the following questions :

Class (Daily distance travelled in km)	Continuous Classes	Frequency (Number of rickshaws)	Cumulative Frequency less than type
60—64	59.5—64.5	10	10
65—69	64.5—69.5	34	$10 + 34 = 44$
70—74	69.5—74.5	58	$44 + 58 = 102$
75—79	74.5—79.5	82	$102 + 82 = 184$
80—84	79.5—84.5	10	$184 + 10 = 194$
85—89	84.5—89.5	6	$194 + 6 = 200$

- (i) Which is the modal class ? Why ?
- (ii) Which is the median class and why ?
- (iii) Write the cumulative frequency (C.F.) of the class preceding the median class.
- (iv) What is the class interval (h) to calculate median ?