

# MT

2017 \_\_\_\_ 1100

Seat No.

## MT - MATHEMATICS (71) ALGEBRA - SEMI PRELIM - I - PAPER - 3 (E)

Time : 2 Hours

(Pages 4)

Max. Marks : 40

### Q.1. Solve the following : (Any 5)

5

- (i) Form an equation for the following example :

The sum of a natural number 'x' and its reciprocal is  $\frac{37}{6}$ .

- (ii) Form the quadratic equation if its roots are 0 and - 6.

- (iii) Find the sum and product of the roots if one root of the quadratic equation is  $2\sqrt{3} - 4$ .

- (iv) If  $df_i x_i = 680$  and  $df_i = 30$ , then the value mean is ?

- (v) Following table shows frequency distribution of no. of rooms occupied in a hotel per day.

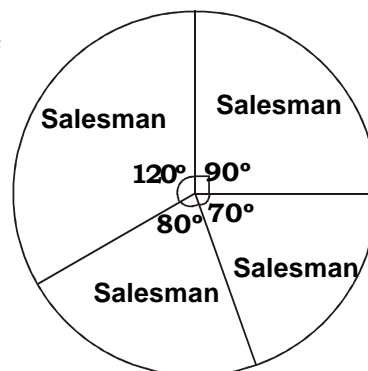
No. of rooms occupied	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
No. of days	5	27	17	11	9	1

Locate the median class and find L, N, c.f, f, h.

- (vi) The sales due to salesmen in week are given below by the pie diagram.

If the total sale due to salesman A is Rs. 18000.

Find the total sale.



## Q.2. Solve the following : (Any 4)

8

- (i) Determine the nature of roots of the following equation from discriminant :  $y^2 + 8y + 5 = 0$ .

- (ii) Following table gives age distribution of people suffering from 'Asthama due to air pollution in certain city.

Age in years	7-11	11-15	15-19	19-23	23-27	27-31	31-35	35-39
No. of people	5	9	13	21	16	15	12	9

Find mean age of person suffering from 'Asthama' by 'Direct Method'.

- (iii) Form the quadratic equation whose one of the root is  $\sqrt{3} - \sqrt{7}$ .

- (iv) Following table gives frequency distribution of time (in minutes) taken by a person in watching T.V. on a day

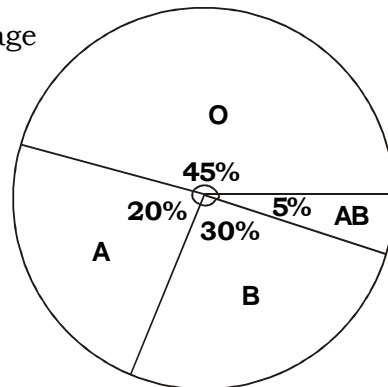
Time (in min)	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90	90 - 100
No. of persons	4	6	19	14	8	7	2

Obtain modal time taken for watching a T.V. by a person on a day.

- (v) Represent the following data by histogram :

Price of sugar per kg (in ₹)	18 - 20	20 - 22	22 - 24	24 - 26	26 - 28	Total
Number of weeks	4	8	22	12	6	52

- (vi) The following pie diagram shows percentage of persons according to blood group. Find the measure of central angle for each blood group.



**Q.3. Solve the following : (Any 3)****9**

- (i) Find  $m$ , if the roots of the quadratic equation  $(m - 1)x^2 - 2(m - 1)x + 1 = 0$  has real and equal roots.

- (ii) Below is given frequency distribution of driving speed (in kms/hour) of a vehicle of 400 college students.

Speed (in kms/hr)	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
No. of students	6	80	156	98	60

Find mean driving speed of a college student.  
(Use Assumed mean method)

- (iii) Solve the following equation :  
 $7y^4 - 25y^2 + 12 = 0$

- (iv) Area under different crops in a certain village is given below. Represent it by pie diagram

Crop	Jowar	Wheat	Sugarcane	Vegetables
Area in hectare	8000	6000	2000	2000

- (v) If the sum of the roots of the quadratic is 3 and sum of their cubes is 63, find the quadratic equation.

**Q.4. Solve the following : (Any 2)****8**

- (i) The difference between two positive integers is 2 and the difference between their cubes is 56. Find the numbers.

- (ii) The following table shows ages of 300 patients getting medical treatment in a hospital on a particular day.

Age (in years)	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of patients	60	42	55	70	53	20

Find median age of patients.

- (iii) The following data summarises the result of a certain examination.

Class marks	5	15	25	35	45	55	65	75
No. of students	0	2	16	36	27	11	8	0

- (a) Prepare usual classification  
 (b) Draw histogram

**Q.5. Solve the following : (Any 2)**

**10**

- (i) For doing some work Ganesh takes 10 days more than John. If both work together they complete the work in 12 days. Find the number of days if Ganesh worked alone ?
- (ii) Below is given frequency distribution of marks (out of 100) obtained by the students.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of students	3	5	7	10	12	15	12	6	2	8

Find mean by 'step deviation method'.

- (iii) Following is the frequency distribution of customers in a certain year at the departmental store :

No. of customers	50 - 100	100 - 150	150 - 200	200 - 250	Total
No. of days	90	98	138	39	365

Draw histogram and hence draw frequency curve.