Q.P. SET CODE
D

MT - z

Seat No. | | | | | | | |

2017 ___ ___ 1100 - MT - z - MATHEMATICS (71) ALGEBRA - SET - D (E)

Time : 2 Hours **(Pages 4)** **Max. Marks : 40**

Note :

(i) All questions are compulsory.

(ii) Use of calculator is not allowed.

Q.1. Solve ANY FIVE of the following : **5**

(i) Is the following list of numbers an Arithmetic Progression ? Justify.
3, 6, 12, 24, ...

(ii) Determine whether the given value of 'x' is a root of given quadratic equation : $x^2 - 2x + 1 = 0$, $x = 1$.

(iii) Find the value of discriminant of the following equation :
$3x^2 + 2x - 1 = 0$

(iv) Examine whether the point (2, 5) lies on the graph of the equation $3x - y = 1$.

(v) If S = {HH, HT, TH, TT} and A = {HT}, then write Aà.

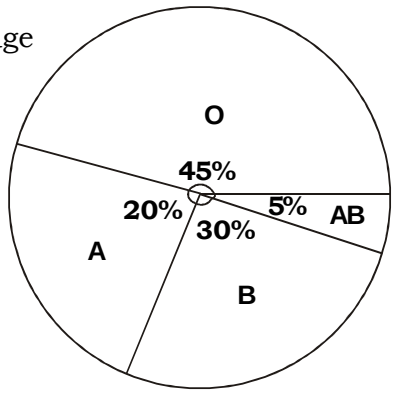
(vi) For a certain frequency distribution the value of Mean is 101 and Median is 100. Find the value of Mode.

Q.2. Solve ANY FOUR of the following : 8

(i) For an A. P. if $t_4 = 12$, and $d = -10$, then find its general term.

(ii) State whether k is the root of the given equation $y^2 - (k - 4)y - 4k = 0$.

(iii) The following pie diagram shows percentage of persons according to blood group. Find total number of persons if there are 600 persons of blood group B.



(iv) Solve the following simultaneous equations using Cramer's rule :
$3x - y = 7$; $x + 4y = 11$

(v) In the following experiment, write the sample space S, number of sample point n (S), event A, B and n (A), n (B).
A die is thrown. A is the event that prime number comes up.
B is the event that the number divisible by three comes up.

(vi) Find the first three terms of the sequence for which S_n is given below : $S_n = \frac{n^2 (n + 1)^2}{4}$.

Q.3. Solve ANY THREE of the following : 9

(i) There is an auditorium with 35 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row, and so on. Find the number of seats in the twenty fifth row.

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

(iii) A coin is tossed three times then find the probability of
(a) getting head on middle coin
(b) getting exactly one tail

(iv) Draw the histogram to represent the following data.

Daily sales of a store in (₹)	0-1000	1000-2000	2000-3000	3000-4000	4000-5000	Total
Number of days in a month	2	12	10	4	2	30

(v) The following table gives information about the monetary investment by some residents in a city :

Mode of investment	Shares	Mutual funds	Real estate	Gold	Government bonds
Percentage of residents	10	20	35	30	5

Draw pie diagram to represent the data.

Q.4. Solve ANY TWO of the following : 8

(i) Find three consecutive terms in an A.P. whose sum is – 3 and the product of their cubes is 512.

(ii) Find the value of k for which the given simultaneous equations have infinitely many solutions : $kx + y = k - 2$; $9x + ky = k$.

(iii) Two dice are thrown, find the probability of getting :

(a) The sum of the numbers on their upper faces is divisible by 9.

(b) The sum of the numbers on their upper faces is at the most 3.

(c) The number on the upper face of the first die is less than the number on the upper face of the second die.

Q.5. Solve ANY TWO of the following : 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) A boat takes 6 hours to travel 8 km upstream and 32 km downstream, and it takes 7 hours to travel 20 km upstream and 16 km downstream. Find the speed of the boat in still water and the speed of the stream.

(iii) Following table gives frequency distribution of amount of bonus paid to the workers in a certain factory.

Bonus paid (in Rs.)	Below 500	Below 600	Below 700	Below 800	Below 900	Below 1000	Below 1100
No. of workers	4	12	24	41	51	58	60

Find median amount of bonus paid to the worker.

Best Of Luck 👍