Q.P. SET CODE
B

MT - x

Seat No. | | | | | | | |

2017 ___ ___ 1100 - MT - X - MATHEMATICS (71) ALGEBRA - SET - B (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) Write the first five terms of the following Arithmetic Progression where, the common difference 'd' and the first term 'a' are given : a = 3, d = 4.

(ii) Find the values of a, b, c for following quadratic equation by comparing with standard form : $x^2 - x - 3 = 0$.

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

(iv) Find the value of the following determinant :

$$\begin{vmatrix} -3 & 8 \\ 6 & 0 \end{vmatrix}$$

(v) From a set of 25 cards marked 1 to 25, one card is drawn at random. Write the sample space for this random experiment.

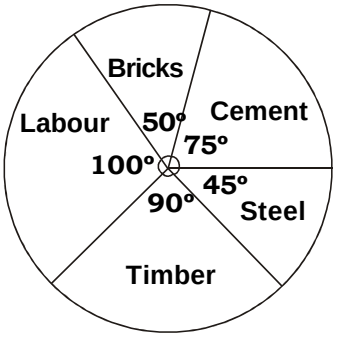
(vi) Find the class marks of the classes 1-10, 11-20.

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

(i) Find S_{10} if a = 6 and d = 3.

(ii) Solve the following quadratic equation by factorization method :
$x^2 - 17x + 60 = 0$.

(iii) The following pie diagram represents expenditure on different items in constructing a building.
Find the expenditure of each of the items if the total construction cost is Rs. 5,40,000.



(iv) What is the equation of X - axis? Hence, find the point of intersection of the graph of the equation x + y = 3 with the X - axis.

(v) In the following experiment write the sample space S, number of sample points n (S), event P using set and n (P).
A die is thrown :
P is the event of getting a prime number.

(vi) Find the eighteenth term of the A. P. : 1, 7, 13, 19, ...

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

(i) The taxi fare is Rs. 14 for the first kilometer and Rs. 2 for each additional kilometer. What will be fare for 10 kilometers ?

(ii) Solve the following quadratic equation by completing square :
$z^2 + 6z - 8 = 0$

(iii) One card is drawn from a well- shuffled deck of 52 cards. Find the probability of getting
(a) king of red colour. (b) a face card. (c) a red face card.

(iv) Draw the histogram for the following frequency distribution.

House - Rent (in ₹ per month)	4000 - 6000	6000 - 8000	8000 - 10000	10000 - 12000
Number of families	200	240	300	50

(v) Following is the componentwise expenditure per article. Draw a pie chart:

Component	Expenditure (in Rs.)
Raw material	800
Labour	300
Transportation	100
Packing	100
Taxes	140

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

(i) Find first negative term from following A.P. 122, 116, 110, ...
(Note : find smallest n such that $t_n < 0$).

(ii) Solve the following simultaneous equations :

$$\frac{27}{x-2} + \frac{31}{y+3} = 85; \quad \frac{31}{x-2} + \frac{27}{y+3} = 89$$

(iii) In the following experiment, write the sample space S, number of sample point n (S), event A, B, C and n (A), n (B), n (C). Also find complementary events, mutually exclusive events and exhaustive events :

Two dice are thrown, A is the event that the sum of the numbers on their upper face is at least nine, B is the event that the sum of the number on their upper face is divisible by 8, C is the event that the same number on the upper faces of both dice.

Q.5. Solve ANY TWO of the following : 10

(i) Solve the following equations :

$$2\left(x^2 + \frac{1}{x^2}\right) - 9\left(x + \frac{1}{x}\right) + 14 = 0$$

(ii) A bus covers a certain distance with uniform speed. If the speed of the bus would have been increased by 15 km/h, it would have taken two hours less to cover the same distance and if the speed of the bus would have been decreased by 5 km/h, it would have taken one hour more to cover the same distance. Find the distance covered by the bus.

(iii) Number of calories (in' 00) consumed daily by a sample of 15 years old boys are given below.

Calories	1000 – 1500	1500 – 2000	2000 – 2500	2500 – 3000	3000 – 3500	3500 – 4000	4000 – 4500
No. of boys	5	13	16	18	27	10	4

Find median calories consumed daily by a boy.

Best Of Luck 👍