MT

2017 ____ ____ 1100 **Seat No.** | | | | | | | |

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

Time : 2 Hours **(Pages 3)** **Max. Marks : 40**

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

(i) For each sequence, find the next four terms :
0.1, 0.01, 0.001, 0.0001, ...

(ii) Write the following quadratic equation in standard form :
$p(p - 6) = 0$.

(iii) Find the value of the following determinant :

$$\begin{vmatrix} -\frac{4}{7} & -\frac{6}{35} \\ 5 & -\frac{2}{5} \end{vmatrix}$$

(iv) Write the first five terms of the following Arithmetic Progression where, the common difference 'd' and the first term 'a' are given :
$a = 3, d = 4$.

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

(vi) Write D_x for the following simultaneous equations :
$3x + 4y = 8$; $x - 2y = 5$.

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

(i) Find the sum of all numbers from 1 to 140 which are divisible by 4.

(ii) Solve the following equation by factorization method :
$y^2 - 16y + 63 = 0$

(iii) If (a, 3) is the point lying on the graph of the equation $5x + 2y = -4$, then find a.

(iv) Solve the following simultaneous equations using Cramer's rule :
$3x + 2y + 11 = 0$; $7x - 4y = 9$.

(v) Find the value of k if $x = 4$ is the solution of the equation :
$3x^2 + kx - 2 = 0$.

(vi) Sachin buys fish from a shop for his aquarium. The shopkeeper takes out one fish at random from a tank containing 5 male fish and 8 female fish. What is the probability that the fish taken out is a male fish ?

Q.3. Solve the following : (Any 3) **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 :
$y^2 = 3 + 4y$

(iii) Sum of two numbers is 60. The greater number is 8 more than thrice the smaller number. Find the numbers.

(iv) 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 :
Two coins are tossed, A is the event of getting at most one head, B is the event getting both heads, C is the event of getting same face on both the coins.

(v) Solve the following quadratic equation by using formula :
$x^2 + 3x - 2 = 0$

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

(i) Second and fourth term of on A.P. is 12 and 20 respectively. Find the sum of first 25 terms of that A.P.

(ii) Solve the following simultaneous equations using graphical method :
$x + y = 8$, $x - y = 2$

(iii) A coin is tossed three times then find the probability of
(a) getting head on middle coin
(b) getting exactly one tail
(c) getting no tail

Q.5. Solve the following : (Any 2) **10**

(i) Solve the following simultaneous equations :

$$\frac{1}{3x}+\frac{1}{5y}=\frac{1}{15};\ \frac{1}{2x}+\frac{1}{3y}=\frac{1}{12}$$

(ii) Find four consecutive terms in an A.P. whose sum is –54 and the sum of 1^{st} and 3^{rd} term is – 30.

(iii) Some part of a journey of 555 km was completed by a car with speed 60 km/h then the speed is increased by 15 km/h and the journey is completed. If it takes 8 hours to reach, find the time taken and distance covered by 60km/h speed.

Best Of Luck