End Semester/Reappear (Semester I) Examination December 2022

Programme: B. Sc. (Hons.) Agriculture **Full Marks: 50**
Subject: Elementary Mathematics **Time: 2 Hrs.**
Subject Code: 13A.111
Enrollment No: _____

Section I

1. **Short Answer type questions. Answer any four.** **4 x 5 = 20**

   a. If the line through the points (– 2, 6) and (4, 8) is parallel to the line through the point (8, 12) and (x, 24), find the value of x.

   b. Find the equation of a circle, the end points of one of whose diameters are A (2, –3) and B (0 – 3, 5).

   c. Evaluate $\int (5x^2 + 2x^{-5} - 7x + \frac{1}{\sqrt{x}} + \frac{5}{x})dx$

   d. Find dy/dx when x = a (t + sint) and y = a (1 – cost).

   e. Define transpose of matrix, symmetric matrix, sub - matrix, upper triangular and orthogonal matrix.

   f. If y = e^{x}log (sin2x), find dy/dx.

Section II

Long answer type questions. Answer any two. **2 x 15 = 30**

2. a. If y = (sin x + cos x)/ (sin x – cos x) the find dy/dx
   b. Differentiate e^{ax} cos (bx + c) with respect to x.

3. a. Find the equation of the circle whose centre lies on the line x – 4y = 1 and which passes through the points (3, 7) and (5, 5).
   b. Find the equation of the circle whose centre is (2, –3) and which passes through the intersection of the lines 3x + 2y = 11 and 2x + 3y = 4.

4. a. Find the value of k for which the lines 3x + y = 2, kx +2y = 3 and 2x – y = 3 may intersect at a point.
   b. If the slope of the line joining the points A(x, 2) and B (6, – 8) is – (5/4), find the value of x.

5. a. Solve the given system of equation, using matrix method; x + y + z = 6, x – y + z = 2, 2x + y – z =1.
   b. Construct a 3 x 2 matrix whose elements are given by a$_{ij}$ = (2i – j)

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