PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF MANAGEMENT
MID TERM EXAMINATION - APRIL 2023

Semester : LATERAL ENTRY- 2022 BATCH   **Date :** 18-APR-2023
Course Code : MAT2071   **Time:** 2:00 PM-3:30PM
Course Name : Mathematics for Engineers   **Max Marks :** 50
Program : B.TECH   **Weightage :** 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

Part A

Answer all the Questions. Each question carries two marks.   (5Qx 2M=10M)

1.   If 3,6,9 are the eigen values of A then list the eigen values of A^2 .   (CO1) [Knowledge]

2.   State the formula of regression lines of x on y.   (CO1) [Knowledge]

3.   If u=x^2 +y^2 then $\dfrac{\partial^2 u}{\partial y^2} = $ ------   (CO2) [Knowledge]

4.   Is $z = \dfrac{x^2 - y^2}{x - y}$ homogeneous function or not? If yes, then identify the degree of z.

          (CO2) [Knowledge]

5. Define Jacobian of x and y with respect to u and v.   (CO2) [Knowledge]

Part B

Answer all the Questions. Each question carries five marks.   (4Qx 5M=20M)

6.   Estimate the solution of the following system of equations by Gauss elimination method
$2x + 5y + 7z = 52$
$2x + y - z = 0$ (CO1) [Comprehension]
$x + y + z = 9$

7.   Locate the correlation coefficient for the following values of x and y   (CO1) [Comprehension]

x	1	2	3	4	5
y	2	5	3	8	7

8. If $u = \tan^{-1}\left(\dfrac{x^3 + y^3}{x + y}\right)$, locate $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y}$. .   (CO2) [Comprehension]

9. Estimate $\displaystyle\int_0^5 \int_0^{x^2} x(x^2 + y^2)\,dy\,dx$.   (CO2) [Comprehension]

Part C

Answer all the Questions. Each question carries ten marks.   **(2Qx 10M=20M)**

10. Compute the Eigen values and Eigen vectors of the matrix $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$

        (CO1) [Application]

11. Compute the extreme values of the function $f(x, y) = x^3 + y^3 - 3x - 12y + 20$.

        (CO2) [Application]