

Total No. of Pages: 1

Roll No.....

IInd SEMESTER

B. Tech. (Common for

MID SEMESTER EXAMINATION

(MARCH-2019)

MA 102: Mathematics-II

Time: 1:30 Hours

Max. Marks: 25

Note: All questions are compulsory. All questions carry equal marks. Assume suitable missing data, if any.

Q1. Test the consistency and hence solve the following system of equations:

$$x + 2y - z = 3$$

$$3x - y + 2z = 1$$

$$2x - 2y + 3z = 2$$

$$x - y + z = -1$$

Q2. Find the matrix A whose eigenvalues and corresponding eigenvectors are as follows:

Eigenvalues: 1, -1, 2 ; Eigenvectors: $(1, 1, 0)^T$, $(1, 0, 1)^T$, $(3, 1, 1)^T$

Q3. Find the general solution of the differential equation

$$\frac{d^2y}{dx^2} - \frac{6}{x^2}y = x \log x$$

Q4. By using the method of variation of parameters, find the general

solution of the differential equation $\frac{d^2y}{dx^2} - n^2y = \sec nx$

Q5. Find the power series solution of the equation

$$(x^2 + 1)y'' + xy' - y = 0 \text{ about the point } x = 0.$$

- END -