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II[nd] 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** $(x^2+1)y''+xy'-y=0$ **about the point** $x=0$.

**- END -**