Sections: A-G

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belgaum)

II Sem B.E. (Credit System) Mid Semester Examinations - II, March 2014

13MA201 - ENGINEERING MATHEMATICS - II

Duration: 1 Hour Max. Marks: 20

*Note: Answer **Five full** questions choosing at least **Two** from **each Part.***

Part – I

1. Find the inverse Laplace transform of $(i)\ \frac{s+3}{s^2+2s+5}$ $(ii)\ \log\left(\frac{s+a}{s}\right)$.

2. State and prove convolution theorem.

3. Solve the differential equation $\cos(x+y+1)dx - dy = 0$.

4. Solve the differential equation $(1+3e^{x/y})dx + 3e^{x/y}(1-x/y)dy = 0$

Part – II

5. Using Rayleigh's power method, obtain the largest eigen value and the corresponding eigen vector of the matrix $\begin{bmatrix} 4 & 1 & -1 \\ 2 & 3 & -1 \\ -2 & 1 & 5 \end{bmatrix}$. Start with the initial eigen vector $\begin{bmatrix} 1 \\ 0.8 \\ 0.8 \end{bmatrix}$ and carry out six iterations.

6. Check whether $V = \{(x,y)/x,y \in R\}$ with vector addition defined by $(x_1,y_1)+(x_2,y_2)=(x_1+x_2,y_1+y_2)$ and scalar multiplication defined by $\alpha(x_1,y_1)=(\alpha x_1,y_1)$ is a vector space.

7. (i) Define linear dependence and linear independence of vectors.
(ii) Check whether the set of vectors $V = \{(1,2,-1),(1,-2,1),(-3,2,-1)\}$ is linearly dependent.

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