Code.No: 09A1BS04 | R09 | SET-4

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
I B.TECH – REGULAR EXAMINATIONS, JUNE - 2010
MATHEMATICAL METHODS
(COMMON TO EEE, ECE, CSE, EIE, BME, IT, ETE, E.COMP.E, ICE)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Find the Rank of the Matrix, by reducing it to the normal form $\begin{bmatrix} 1 & 3 & 4 & 5 \\ 1 & 2 & 6 & 7 \\ 1 & 5 & 0 & 10 \end{bmatrix}$

b) Find whether the following system of equations are consistent. If so solve them.
$x + 2y + 2z = 2$, $3x - 2y - z = 5$, $2x - 5y + 3z = -4$, $x + 4y + 6z = 0$. [7+8]

2. Find the eigen values and the corresponding eigen vectors of $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$ [15]

3. Reduce the quadratic form to the canonical form $3x^2 + 2y^2 + 3z^2 - 2xy - 2yz$ [15]

4.a) Prove that the newton's method has quadratic convergence.
b) Find y(5) given that y(0)=1, y(1)=3, y(3)=13, and y(8) = 123 using Lagrange's formula. [8+7]

5.a) Find $\frac{dy}{dx}$ at x=7.5 from the following table.

x	7.47	7.48	7.49	7.5	7.51	7.52	7.53
y	.193	.195	.198	.201	.203	.206	.208

b) Find the first two derivative at x=1.4 from the following data: [8+7]

x	1.0	1.2	1.4	1.6	1.8	2.0
y	0	.128	.544	1.296	2.432	4.0

6. Using Euler's method, solve for y at x=2 from $\frac{dy}{dx} = 3x^2 + 1$, $y(1) = 2$ taking step size:

a) h = 0.5
b) h = 0.25. [8+7]

7.a) Expand f(x)= cosx for $0 < x < \Pi$ in half range sine series.
b) Find cosine and sine series for $f(x) = \Pi - x$ in $[0, \Pi]$. [7+8]

8.a) Solve (mz - ny) p + (nx - lz)q = (ly - mx).
b) Solve $(x^2 - y^2 - yz)\,p + (x^2 - y^2 - zx)\,q = z(x - y)$. [7+8]

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