Subject Code: R13107/R13 **Set No - 1**

I B. Tech I Semester Supplementary Examinations May/June - 2016

MATHEMATICS-II (MATHEMATICAL METHODS)

(Common to ECE, EEE, EIE, BioTech, EComE, Agri.E)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**

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PART-A

1. (a) Find the root of the equation n f(x) = $1+\tan^{-1}(x)$ by iteration method
   (b) Prove that $\Delta = \nabla E = E^{1/2}$
   (c) Write the merits and demerits of Picard's Method
   (d) Find the Half range sine series of f(x) = x in [0,2]
   (e) Find the finite Fourier cosine trans form of f(x) = $\pi/3 - x + x^2/2\pi$ in $[0,\pi]$
   (f) Find Z[sinht]

[4+3+3+4+4+4]

PART-B

2. (a) Find the Real root of $xe^x = 2$ by False position method
   (b) Find the Real root of $x^4 - x - 9 = 0$ by Newton –Raphson method

[8+8]

3. (a) Find the population for the year 1963 from the following table

Year(x)	1921	1931	1941	1951	1961
Population(y)	19.96	39.65	58.81	77.21	94.61

   (b) Find the interpolation polynomial form the following data

X	5	6	9	11
Y	12	13	14	16

[8+8]

4. (a) Apply Rk method of fourth order to find y(1.2) given that $y^1 = x^2 + y^2$, y(1)= 1.5
   (b) Find y(0.1) by Modified Euler's method given that $\frac{dy}{dx} = \frac{y-x}{y+x}, y(0) = 1$

[8+8]

5. (a) Obtain Fourier series for f(x) = e^{ax} *in* $[-\pi, \pi]$
   (b) Find the Half range cosine series for $f(x) = \begin{cases} kx, 0 \le x < l/2 \\ k(l-x),\ l/2 \le x \le l \end{cases}$

(8+8)

6. (a) Find Fourier transform of $f(x) = xe^{-x}$ $o < x < \infty$
   (b) Find the Fourier sine transform of $e^{-|x|}$ and hence evaluate $\int_0^\infty \frac{x \sin mx}{1+x^2} dx$

[8+8]

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7. Find (a) $Z[n^2a^n]$
(b) $Z[\sinh(n\pi/2+\theta)]$
(c) $Z[n \sin n\theta]$
(d) $Z^{-1}\left[\frac{z^2+z}{(z-1)^2}\right]$

[4+4+4+4]

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