Code No: R13207 **R13** **SET-1**

I B. Tech II Semester Supplementary Examinations, Nov - 2017
MATHEMATICS-II (MM)
(Com. to CE,ME,CSE,PCE,IT,Chem E,Aero E, Auto E,Min E, Pet E,Metal E & Textile E)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**

~~~~~~

PART –A

1. a) Find the value of $\frac{1}{5}$ using Newton Raphson method. (4M)
   b) If the interval of differencing is unity, prove that $\Delta[x(x+1)(x+2)(x+3)]=4(x+1)(x+2)(x+3)]$. (3M)
   c) Evaluate y (0.1) using Euler's method for $\frac{dy}{dx}=x-ye^{x}$, $y(0)=1$ (4M)
   d) Write the half range sine series for $f(x) = \frac{x}{a}$ in (0,1). (4M)
   e) Write Fourier cosine integral. (3M)
   f) Find Z (n^2). (4M)

PART -B

2. a) Find the Real root of the equation $x\log_{10} x=1.2$ using false position method. (8M)
   b) Find the Real root of the equation $x^3-x-11 = 0$ using bisection method. (8M)
3. a) Find the number of men getting wages between 10 and 15 from the following data. (8M)

Wages in rupees	0-10	10-20	20-30	30-40
Frequency	9	30	35	42

   b) Find y(25), Given that $y_{20}=24, y_{24}=32, y_{28}=35, y_{32}=40$ using Gauss forward difference formula. (8M)
4. a) Evaluate y (0.1) using RK method of fourth order for $\frac{dy}{dx}=y-\frac{2x}{y}$, $y(0)=1$ (8M)
   b) Evaluate y (0.1) using Picard's method for $\frac{dy}{dx}=y+x^2$, $y(0)=1$ (8M)
~~~~~~

Code No: R13207 **R13** **SET-1**

5. a) Obtain the Fourier expansion of xsinx in $(0,2\pi)$. (8M)

   b) Find the half range cosine expansion of $f(x)=\begin{cases}2, & if \ 0<x<1\\ x, & if \ 1<x<2\end{cases}$ (8M)

6. a) Prove that (i) $F_s\{f(ax)\}=\frac{1}{a}F_s\left(\frac{p}{a}\right)$ (ii) $F_s\left\{f\left(\frac{x}{a}\right)\right\}=aF_s(ap)$ (8M)

   b) Find the Fourier cosine and sine transform of e^{-ax}, a > 0 and hence deduce the inversion formula. (or) Deduce the integrals (i) $\int_0^\infty \frac{\cos px}{a^2+p^2}dp$ ii) $\int_0^\infty \frac{p\sin px}{a^2+p^2}dp$ (8M)

7. a) Solve the difference equation, using Z – transform $y_{n+2}-4y_{n+1}+3y_n=0$ given that $y_0 = 2$ and $y_1 = 4$. (8M)

   b) Find $Z[e^n \sin n\theta]$. (8M)