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

I B. Tech II Semester Supplementary Examinations, April/May - 2018
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**

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PART –A

1. a) Write the iteration formula to find $\frac{1}{a}$ using Newton Raphson method. (3M)

b) If the interval of differencing is unity prove that $\Delta\frac{2^x}{x!}=\frac{2^x(1-x)}{(x+1)!}$ (4M)

c) Evaluate y (0.1) using Euler's method for $\frac{dy}{dx}=xy+e^x$, $y(0)=1$ (4M)

d) Write the half range sine series for $f(x)=\frac{x}{a}$ in $(0,\pi)$. (4M)

e) Write Fourier integral theorem. (3M)

f) Find Z (n^3). (4M)

PART -B

2. a) Find the Real root of the equation $x\log_{10}x=1.2$ using bisection method. (8M)

b) Find the Real root of the equation x^3-x-11 = 0 using iteration method. (8M)

3. a) Find the missing values in the following table. (8M)

X	0	5	10	15	20	25
Y	6	10	-	17	-	31

b) Find the interpolating polynomial f(x) from the table. (8M)

X	0	1	4	5
f(x)	4	3	24	39

4. a) Evaluate y(0.1) using modified Euler's method for $\frac{dy}{dx}=y+\frac{2x}{y}$, $y(0)=1$ (8M)

b) Evaluate y(0.1) using Taylor's method for $\frac{dy}{dx}=y+x^2$, $y(0)=1$ (8M)
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5. a) Find the Fourier expansion of $f(x)=\begin{cases}2, & if \ -2<x<0\\ x, & if \ \ 0<x<2\end{cases}$ (8M)

b) Find the half range cosine series of $f(x)=e^{-x} \ 0<x<2\pi$ (8M)

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

b) Find the Fourier transform of f(x) defined by $f(x)=e^{-\frac{x^2}{2}}, -\infty<x<\infty$ (8M)

7. a) Solve the difference equation $y_{n+2}-6y_{n+1}+9y_n=3^n, \ y_0=1, y_1=3$ using Z-Transform. (8M)

b) Find Z[e^n cosnθ]. (8M)