Code No: R13107 **R13** SET - 1

I B. Tech I Semester Supplementary Examinations, Oct/Nov - 2018
MATHEMATICS-II (MM)
(Com. to ECE, EEE, EIE, Bio-Tech, E Com E, Agri 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) Prove that $\mu^2 = 1 + \frac{\delta^2}{4}$ (4M)

b) Find four iterations of $x^3 - 3x + 1 = 0$ using Iteration method. (4M)

c) Apply Euler method to find the solution of $\frac{dy}{dx} = 1 + y$ and $y(0) = 1$ at $x = 0.25$. (4M)

d) Find the half range sine series of f(x) = ax in [0,1]. (4M)

e) Find the Fourier transform of $f(x) = \begin{cases} ax, for |x| < 1 \\ 0, for |x| > 1 \end{cases}$ (3M)

f) Find the Z- trans form of 2^{2k+3} (3M)

PART -B

2. a) Find f(45) from the following table. (8M)

x	10	20	30	40
y	20	35	40	47

b) Find y(x) and $y^1(x)$ for the following table. (8M)

x	0	1	2	3
y	1	2	1	10

3. a) Find the positive root of $2^x - 3x = 0$ using False position Method. (8M)

b) Find the positive root of $xe^x = 1$ using Bisection Method. (8M)

4. a) Evaluate y (1.2) and y (1.4) by RK method of fourth order if $y' = 1 + 2xy, y(1) = 1$. (8M)

b) Find y(0.2),y(0.4) by Modified Euler's method given that $\frac{dy}{dx} = x + \left|\sqrt{y}\right|$, $y(0) = 1$ (8M)

5. a) Find the Fourier series of $f(x) = \begin{cases} 0, -\pi < x < 0 \\ 1, \ 0 < x < \pi \end{cases}$ (8M)

Hence deduce that $1 - \frac{1}{3} + \frac{1}{5} + \ldots = \frac{\pi}{4}$
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b) Find the Half range cosine series $f(x)=\begin{cases}\frac{1}{2}+x & 0\le x\le\frac{1}{4}\\ \frac{1}{2}-x & \frac{1}{4}<x<\frac{1}{2}\end{cases}$ (8M)

6. a) Find the fourier sine transform of $f(x)=\frac{e^{-ax}}{x}$ (8M)

b) Using Fourier integral, Show that $\int_0^\infty \frac{1-\cos\pi\lambda}{\lambda}\sin\lambda x d\lambda=\begin{cases}\frac{\pi}{2} & if\ 0<x<\pi\\ 0 & if\ x>\pi\end{cases}$ (8M)

7. a) Solve the difference equation $y_{n+2}-7y_{n+1}-8y_n=2^n,\ y_0=y_1=0$ using Z-Transforms. (8M)

b) If $f(z)=\frac{2z+3z+4}{(z-1)^3}$, $|z|>3$, then find the value of f(1), f(2) and f(3) (8M)