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

I B. Tech I Semester Supplementary Examinations, Nov/Dec. - 2017
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. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Find four approximation of $x = x^4 - 10$ using Iteration method. (4M)

b) Prove that $\mu\delta = \frac{1}{2}\Delta E^{-1} + \frac{1}{2}\Delta$ (3M)

c) By Euler's method find y(0.2), y(0.4) given that $\frac{dy}{dx} = \cos xy, y(0) = 1$ (4M)

d) Find a_0 , a_n for $f(x) = \frac{x}{2}$ in $[0,2\pi]$. (4M)

e) State and prove linear property in Fourier transform. (4M)

f) Find $Z(a^n)$. (3M)

PART -B

2. a) Find the four approximations of $xe^x = 1$ by Bisection method. (8M)

b) Find the four approximations of $x\log_{10} x = 2$ by False position method. (8M)

3. a) Fit a cubic polynomial for the following data. (8M)
$y_0 = -5, y_1 = -1, y_2 = 9, y_3 = 25, y_4 = 55, y_5 = 105$

b) Find the y(4) for the following data. (8M)

x	0	2	3	6
y	707	819	866	966

4. a) Evaluate y (0.1), y (0.2) & y (0.3) using Taylor's Series method given that $y^1 = y^2 + x^2$, y (0) =1. (8M)

b) By modified Euler's formula find y(0.2), y(0.4) given that $\frac{dy}{dx} = 2xy^2, y(0) = 1$ (8M)
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5. a) Expand $f(x) = xsinx \quad 0 < x < \pi$ as half range sine series. (8M)

   b) Find the Fourier Series of $f(x) = |sinx| \quad -\pi \le x \le \pi$ (8M)

6. a) Find the Fourier cosine transform of $\frac{1}{\sqrt{x}}$ (8M)

   b) Find the Fourier transform of $e^{-\frac{x^2}{2}}$. (8M)

7. a) Prove that If $Z[f(n)] = F(z)$, then $\underset{z\to\infty}{Lt} F(z) = f(0)$. (8M)

   b) Solve the difference equation $y_{n+2} - 5y_{n+1} + 6y_n = 3n + 5,\ y_0 = 1, y_1 = 3$ using Z-Transforms. (8M)