Code No: RA161252 **R16** RA

I B. Tech II Semester Supplementary Examinations, April/May - 2018
MATHEMATICS-II (MM)
(Com. to CSE, IT)

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 **FOUR** Questions from **Part-B**

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PART –A

1. a) Find first two iterations of $x = e^{-x}$ using iteration method. (2M)

   b) Establish the relation $\Delta^2 f_i = (f_i + f_{i+1}).\Delta f_i$ (2M)

   c) By Euler's method find y(0.3),y(0.6) given that $\frac{dy}{dx} = x^2 + y^2, y(0) = 1$ (2M)

   d) Write Numerical quadrature formula. (2M)

   e) Find L [$t.e^t$]. (2M)

   f) Find a_n if f(x) = sinx in [0,1] expressed as a Fourier series. (2M)

   g) If f(x) = 1/x find Fourier sine transform. (2M)

PART -B

2. a) Find the real root of $x + \log_{10} x - 2 = 0$ using False position method. (7M)

   b) Find the real root of $x^2+4\sin x = 0$ using Newton raphson method. (7M)

3. a) Find y(2.4) using Newton's Back ward difference formula from the table. (7M)

X	1	1.4	1.8	2.2
Y	3.49	4.82	5.91	6.5

   b) Find the interpolating polynomial f(x) from the table. (7M)

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

4. a) Find y(0.1),y(0.2) if $\frac{dy}{dx} = xy + 1, y(0) = 1$ using Modified Euler's fourth order. (7M)

   b) Evaluate $\int_{0.5}^{0.7} x^{\frac{1}{7}} e^{-x} dx$ using Simpson3/8th Rule. (7M)
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5. a) Find the Half range cosine series for f(x) = x^2 in [0, π] (7M)
Hence deduce that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-.....$

b) Find the Fourier series of $f(x)=e^{-x}\ \ 0<x<2$ (7M)

6. a) Find the Fourier cosine transform of $e^{-\frac{x^2}{2}}$ (7M)

b) Find the Fourier transform of $f(x)=\begin{cases}\cos x\ if & |x|<a\\ 0\ if & |x|>a\end{cases}$ (7M)

7. a) A Homogenous rod of conducting material of length 100 cm has its ends kept at zero temperature and the temperature initially is (7M)

$$u(x,0)=\begin{cases}x & 0<x<50\\ 100-x & 50<x<100\end{cases}$$

Find the temperature $u(x,t)$ at any time.

b) Solve the wave equation $\frac{\partial^2 y}{\partial x^2}=c^2\frac{\partial^2 y}{\partial t^2}$ subject to the following conditions (7M)

1. $y(0,t)=0$
2. $y(\pi,t)=0$
3. $y(x,0)=2(Sinx+Sin3x)$
4. $\frac{\partial y}{\partial t}(x,0)=0$