Subject Code: RA13207/R13 **[Re Admitted]** **Set No - 1**

I B. Tech II Semester Regular/Supplementary Examinations April/May - 2017
MATHEMATICS-II (MM)
(Computer Science and Engineering)

Time: 3 hours **Max. Marks: 70**

Question Paper Consists of **Part-A** and **Part-B**
Answering the question in **Part-A** is Compulsory,
Three Questions should be answered from **Part-B**
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PART-A

1. a) Write the working rule to find the root of the equation y= f(x) by bisection method.
   b) Prove that $\Delta \log f(x) = \log\left[1+\frac{\Delta f(x)}{f(x)}\right]$
   c) By Picard's method find y(0.1) given that $\frac{dy}{dx} = x^2 y - 1, y(0) = 1$
   d) Find Half range sine series for f(x) = 1-ax in [0,1].
   e) If F(p), is Fourier transform of f(x), then prove that the Fourier transform of f(x – a) is e^{ipa} F(p).
   f) Find Z[sinnθ]. [3+3+4+4+4+4]

PART-B

2. a) Find the root of the equation 3x = 1+cosx by False position method.
   b) Find the root of the equation x^2 -8x-4=0 by Newton Raphson method. (8+8)

3. a) Find f(6.5) using Newton's Backward formula for the following table:

x	0	1	2	3	4	5	6
y = f(x)	0	1	16	81	256	625	1296

   b) Find the Lagrange's polynomial for the following data: (8+8)

x	0	1	2	4
y	3	6	10	14

4. a) By RK method of fourth order find y (0.2) ,y(0.4) given that $\frac{dy}{dx} = y^2 + x, y(0) = 1$
   b) Obtain Taylor's series expansion for $\frac{dy}{dx} = x^2 y - 1,\ y(0) = 1$, hence evaluate y (0.1). (8+8)

5. a) Find the half-range cosine for the function f(x) = sinax in the range 0<x<π.
   b) Find Fourier expansion for f(x) = x+x^2 -1<x<1. (8+8)

6. a) Find the Fourier transform of f(x) defined by $e^{-\frac{x^2}{2}}$
   b) Find the Fourier sine transform of $f(x) = \frac{x}{\pi},\ 0 < x < \pi$. (8+8)

7. a) Solve the difference equation $y_{n+2} - 7y_{n+1} - 8y_n = 2^n,\ y_0 = y_1 = 0$ using z transform.
   b) Evaluate $Z^{-1}\left[\frac{z}{(z^2+6z+8)}\right]$ (8+8)