1. (a) Find the root of the equation $3x = 1 + \cos x$ by Iteration method.

- (b) Prove that $\Delta \log f(x) = \log \left[1 + \frac{\Delta f(x)}{f(x)} \right]$
- (c) Evaluate y (0.2) by Euler's method for $\frac{dy}{dx} = \frac{x+y}{y-x}$, y(0) = 1.
- (d) Find $Z\left[\frac{1}{(n+1)!}\right]$
- (e) Obtain Half range sine series for $f(x) = \cos x$ in [0, 1]
- (f) Find finite Fourier cosine transform of f(x) = x+a for $0 < x < \pi$

[3+3+4+4+4+4]

PART-B

I B.Tech II Semester Supplementary Examinations Dec./Jan. – 2015/2016 MATHEMATICS-II (MATHEMATICAL METHODS) (Common to CE, ME, CSE, PCE, IT, Chem E, Aero E, Auto E, Min E, Pet E, Metal E)

> 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 ***** PART-A

- 2. (a) Evaluate $1/\sqrt{12}$ using Newton Raphson method (b) Find the Real root of $4\sin x = e^x$ by False position method 3. (a) Fit a cubic polynomial for the following data $y_0 = 1, y_1 = 2, y_2 = 1, y_5 = 10.$
 - (b) Find the Missing terms in the following data

Х	45	50	55	60	65
у	3		2		-2.4

[8+8]

[8+8]

4. (a) By modified Euler's formula find y(0.01), y(0.02) given that $\frac{dy}{dx} = -y$, y(0) = 1

(b) By RK method of fourth order find y (0.1), y(0.2) given that $\frac{dy}{dx} = 1 + y^2 + x$, y(0) = 0[8+8]

Set No - 1

Max. Marks: 70

Subject Code: R13207/R13

Time: 3 hours

Subject Code: R13207/R13

5. (a) Find the Fourier series of $f(x) = e^{-x} 0 < x < 2\pi$ in $(-\pi, \pi)$,

(b) Find the Half range cosine series for
$$f(x) = \begin{cases} kx & 0 < x < \frac{\pi}{2} \\ k(\pi - x) & \frac{\pi}{2} < x < \pi \end{cases}$$

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

(b) Find the Fourier sine transform of $\frac{e^{-ax}}{x}$

[8+8]

[8+8]

7. (a) Solve the difference equation $y_{n+2} - 5y_{n+1} + 6y_n = 3n+5$, $y_0 = 1$, $y_1 = 3$ using Z-Transforms (b) Find $Z^{-1}\left[\frac{z^2}{(z^2+2z+2)}\right]$

[8+8]

Set No - 1