

I B. Tech II Semester Supplementary Examinations, Nov/Dec - 2018**MATHEMATICS-II (MM)**

(Com. to CE, ME, CSE, PCE, IT, Chem E, Aero E, Auto E, Min E, Pet E, Metal E & Textile Engg)

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 Compulsory3. Answer any **THREE** Questions from **Part-B****PART -A**

1. a) Find $\frac{1}{\sqrt{12}}$ using Newton Raphson method. (4M)
- b) Show that $\sum_{i=0}^{n-1} \Delta^2 f_i = f_n - f_0$ (4M)
- c) Find $y(0.1)$ given that $y' = y + \frac{2x}{y}$, $y(0) = 1$ by Taylor's series method. (4M)
- d) Find the Fourier series of $f(x) = 2x$ in $(-1,1)$ (4M)
- e) Find the Fourier sine transform of e^{-ax} , $a > 0$ (3M)
- f) Find $Z\left(\frac{1}{n+1}\right)$ (3M)

PART -B

2. a) Find the Real root of the equation $x^3 + 2x^2 + 10x - 20 = 0$ using False position method. (8M)
- b) Find the Real root of the equation $x = \cos x$ using Bisection method. (8M)
3. a) Fit the cubic polynomial for the data $(0,-5)$, $(1,1)$, $(2,9)$, $(3,25)$, $(4,55)$, $(5,105)$ (8M)
- b) Find $y(8)$ from the following data. (8M)

x	4	5	7	10
y	8	10	24	30

4. a) Find $y(0.2)$ given that $y' = x + 2\sqrt{y}$, $y(0) = 1$ by modified Euler's method. (8M)
- b) Find $y(0.1)$ given that $y' = 2xy + x^2$, $y(0) = 1$ by RK method of fourth order. (8M)
5. a) Find the half range cosine series for $f(x) = \begin{cases} -\pi, & 0 < x < 1 \\ x, & 1 < x < 2 \end{cases}$ (8M)

- b) Find the Half range sine series of $f(x) = \begin{cases} x & 0 < x < \frac{\pi}{2} \\ -x & \frac{\pi}{2} < x < \pi \end{cases}$ (8M)



6. a) Find the Finite Fourier Cosine transform of $f(x)$ defined by $f(x) = \frac{x}{\pi}$ in $(0, \pi)$ (8M)
- b) Find inverse Fourier cosine transform of $\frac{1}{p} e^{-ap}$ (8M)
7. a) State and prove final value theorem in z-transforms (8M)
- b) Find the inverse Z – transform of $\left[\frac{z^2 + z}{(z-1)^2} \right]$ (8M)

