

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**

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 (8M)
 $y' = y^2 + x^2$, $y(0) = 1$.
- b) By modified Euler's formula find $y(0.2)$, $y(0.4)$ given that $\frac{dy}{dx} = 2xy^2$, $y(0) = 1$ (8M)

5. a) Expand $f(x) = x \sin x$ $0 < x < \pi$ as half range sine series. (8M)
- b) Find the Fourier Series of $f(x) = |\sin x|$ $-\pi \leq x \leq \pi$ (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 $\lim_{z \rightarrow \infty} z F(z) = f(0)$. (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)