U218 - 111 (T1)

Total No. of Questions – [4]

Total No. of Printed Pages 1

G.R. No.	

U218 - 111 (T1)

OCTOBER 2018/ IN-SEM (T1)

S. Y. B. TECH. (CIVIL ENGINEERING) (SEMESTER - I)

COURSE NAME: Engineering Mathematics III

COURSE CODE: CVUA21171

(PATTERN 2017)

Time: [**1 Hour**] [Max. Marks: **30**]

(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2 and Q.3 OR Q.4.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data where ever required**

Q.1) a) Using method of variations of parameter solve $\frac{d^2y}{dx^2}+4y=tan2x$ [6 marks]

b) Solve $x^2\frac{d^2y}{dx^2}-3x\frac{dy}{dx}+5y=x^2\sin(logx)$ [6 marks]

c) Solve $(D^2-4D+4)y=xe^{2x}sin2x$ [4 marks]

OR

Q.2) a) Solve simultaneously following differential equations

$$\frac{dx}{dt}-\omega y=acospt$$
$$\frac{dy}{dt}+\omega x=asinpt$$
[6 marks]

b) $Solve\ (3x+2)^2\frac{d^2y}{dx^2}+3(3x+2)\frac{dy}{dx}-36y=3x^2+4x+1$ [6 marks]

c) Solve the following symmetric differential equation $\frac{dx}{3z-4y}=\frac{dy}{4x-2z}=\frac{dz}{2y-3x}$ [4 marks]

Q.3) a Apply Runge Kutta Fourth order method to find an approximate value of y when x=0.1, given that $\frac{dy}{dx}$=xy+ y^2 ; $x_0=0, y_0=1$,and h=0.1 [6 marks]

b) Solve the following equations by Gauss Seidal method

27x+6y-z=85
x+y+54z=110
6x+15y+2z=72
[4 marks]

c) Using Fourier sine integral representation show that

$$\int_0^\infty \frac{1-cos\pi\tau}{\tau}\ \sin\tau x d\tau = \begin{cases}\frac{\pi}{2} & 0<x<\pi \\ 0 & x>\pi\end{cases}$$
[4 marks]

OR

Q.4) a) *Apply Runge – Kutta* fourth order method to find an approximate value of y when x=0.2, given that $\frac{dy}{dx}=\frac{y^2-x^2}{y^2+x^2}$ and y=1 when x=0., h=0.2 [6 marks]

b) Using Gauss Elimination method Solve the equations

x+y+z=9
2x-3y+4z=13
3x+4y+5z=40
[4 marks]

c) Solve Integral equation $\int_0^\infty f(x)\ \sin\tau x dx = \begin{cases}1-\tau & 0<\tau<1 \\ 0 & \tau>1\end{cases}$ [4 marks]

######END#######