Total No. of Questions – [03] Total No. of Printed Pages: 02

G.R. No.	

Paper Code - U239-111(T1)

OCTOBER 2019INSEM (T1)

S. Y. B.TECH. (Civil Engineering) (SEMESTER III)

COURSE NAME: ENGINEERING MATHEMATICS III

COURSE CODE: ES21181CV

(PATTERN 2018)

Time: [1 Hour] [Max. Marks: 20]

(*) Instructions to candidates:

1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Use of scientific calculator is allowed.

4) Assume suitable data where ever required.

Q 1) Attempt any **one**

a) Solve the following differential equations

(i) $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = e^{2x}sin3x$

(ii) $x^2\frac{d^2y}{dx^2} - 2x\frac{dy}{dx} - 4y = x^5$ [4]+[4]

b) Solve simultaneously the following differential equations

$2\frac{dx}{dt} - x + 3y = sint$,

$2\frac{dy}{dt} + 3x - y = cost$ with boundary conditions $at\ t = 0\ x = \frac{1}{4}\ and\ y = -\frac{1}{20}$ [8]

Q 2) Attempt any **one**

a) Using Runge Kutta 4th order method approximate y at x= 0.2 in steps of h = 0.1 given that $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$, y(0)=1 [8]

b) Evaluate $\int_0^2 \frac{dx}{1+x^2}$ Using (i) Trapezoidal Rule with h=0.2

(ii) Simpsons $\frac{1}{3}^{rd}$ Rule with h=0.2 [8]

Q 3) Attempt any **one**

a) If first four moments about the value 30.2 of a distribution are 0.255, 6.222, 30.211 and 400.25 .Calculate the first four moments about the mean .Also find coefficients of skewness and kurtosis of the distribution. [4]

b) If the two lines of regression are
$8x - 10y + 66 = 0$ &
$40x - 18y - 214 = 0$
Find (i) mean values of x & y (ii) coefficient of correlation between x and y. [4]