B.Tech. SEM -V (Chemical/ Civil/ Electrical/ Mechanical/ Production/ Computer/ Info. Tech./ Electronics / Bio Medical / E & TC) 2014
Course (CBCS) : SUMMER - 2019
SUBJECT : ENGINEERING MATHAMATICS - IV

Day : Friday
Date : 17/05/2019

S-2019-2648

Time : 10.00 AM TO 01.00 PM
Max. Marks : 60

N. B. :

1) All question are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labelled diagram **WHEREVER** necessary.
4) Assume suitable data, if necessary.

Q. 1 Find the root of equation $xe^x = \cos x$ using Regula Falsi method correct to four decimal place **(10)**

OR

Using Newton's iterative method, find the root of $3x = \cos x + 1$ correct to five decimal places.

Q. 2 Solve the following equations by Gauss Jordan method: **(10)**

10x-2y-z-t=3
-2x+10y-z-t=15
-x-y+10z-2t=27
-x-y-2z+10t=-9

OR

Solve:

10x-7y+3z+5u=6
-6x+8y-z-4u=5
3x+y+4z+11u=2
5x-9y-2z+4u=7 by Gauss Elimination method..

Q. 3 Solve simultaneous difference equations: **(10)**

$$y_{x+1} - z_x = 2(x+1)$$
$$z_{x+1} - y_x = -2(x+1)$$

OR

Solve: $u_{n+2} - 4u_{n+1} + 3u_n = 5^n$

P. T. O.

Q. 4 Find the cubic polynomial which takes following values: **(10)**

x	0	1	2	3
f(x)	1	2	1	10

OR

Evaluate: $\int_0^6 \frac{dx}{1+x^2}$ by using

i. Simpson's $1/3^{rd}$ rule
ii. Simpson's $3/8^{th}$ rule.

Q. 5 Using modified Euler's method, find an approximate value of y when x=1.2 and x=1.4 with h=0.2,given that $\frac{dy}{dx} = \log(x+y), y(0) = 2$. **(10)**

OR

Using Runge –Kutta method of fourth order, solve $\frac{dy}{dx} = x + y$ with y(0)=1 at x=0.2, h=0.1

Q. 6 Find the values $u(x,t)$ satisfying the parabolic equation $\frac{\partial u}{\partial t} = 4\frac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(0,t) = u(8,t) = 0$ and $u(x,0) = 4x - \frac{1}{2}x^2$ at the points $x = i : i = 0,1,...8$ and $t = \frac{1}{8}j : j = 0,1,..5$. **(10)**

OR

Solve the Laplace equation $u_{xx} + u_{yy} = 0$ given that

0	11.1	17	19.7	18.6
8		u_1	u_2	u_3	21.9
0		u_4	u_5	u_6	21
0		u_7	u_8	u_9	17
0	9.7	12.1	12.5	9

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