B.TECH. SEM -V (CHEMICAL/ CIVIL/ ELECTRICAL/ MECHANICAL/ PRODUCTION/ COMPUTER/ INFO. TECH./ ELECTRONICS / BIO MEDICAL / E & TC) 2014 COURSE (CBCS)
: SUMMER - 2018
SUBJECT: ENGINEERING MATHAMATICS - IV

Day: **Monday** Time: **10.00 AM TO 01.00 PM**
Date: **28/05/2018** Max Marks. 60

S-2018-2328

N.B. :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat labeled diagrams **WHEREVER** necessary.
4) Assume suitable data, if necessary.

Q.1 Find a root of the equation $x^3 - 4x - 9 = 0$ using bisection method correct to three decimal places. **(10)**

OR

Find root of the equation $x^3 - 2x - 5 = 0$ by method of Regula falsi correct to three decimal places.

Q.2 Apply Gauss elimination method to solve the equations ; **(10)**

$$x + 4y - z = -5$$
$$x + y - 6z = -12$$
$$3x - y - z = 4$$

OR

Apply Gauss – Jordan method to solve the equations;

$$x + y + z = 9$$
$$2x - 3y + 4z = 13$$
$$3x + 4y + 5z = 40$$

Q.3 Solve the difference equations ; **(10)**

$$u_{n+2} - 4u_{n+1} + 4u_n = 2^n$$

OR

Solve the simul tane ous difference equations;

$$u_{x+1} + v_x - 3u_x = x$$
$$3u_x + v_{x+1} - 5v_x = 4^x$$

Q.4 Using Newton's forward formula, find the value of F(1.6), if **(10)**

X	1	1.4	1.8	2.2
F(x)	3.49	4.82	5.96	6.5

OR

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

i) Trapezoidal Rule

ii) Simpson's $\frac{1}{3^{rd}}$ Rule

P.T.O.

Q.5 Use Runge's Kutta method to approximate y when $x = 1.1$. Given that $y = 1.2$ **(10)**

When $x = 1$ & $dy/dx = 3x + y^2$

OR

If $\frac{dy}{dx} = 2e^x - y$, $y(0) = 2$, $y(0.1) = 2.010$

$y(0.2) = 2.04$ & $y(0.3) = 2.09$ Find $y(0.4)$

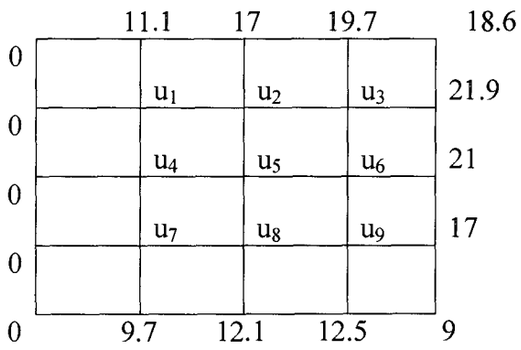
Using Milne's Predictor – corrector method.

Q.6 Solve the poisson equation $u_{xx} + u_{yy} = -81xy$, $o < x < 1$, $o < y < 1$, given that **(10)**

$u(o, y) = 0$, $u(x, o) = 0$ $u(1, y) = 100$, $u(x, 1) = 100$ & $h = 1/3$

OR

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



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