

**UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)****उत्तराखण्ड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)****M.A./M.Sc. Mathematics
ASSIGNMENT-Second YEAR**

*Last Date of Submission: 15 May*जमा करने की अन्तिम तिथि: 15 मई

Course Title: Numerical Analysis**Course Code: M.A. /M.Sc. MAT 508****Year: 2013-14****Maximum Marks : 40****Section 'A'****भाग क**

Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answers 4 questions only.

1. Find $\sqrt{12}$ to five place of decimal by Newton-Raphson method.
2. Find out the eigen values and corresponding eigen vectors of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 3 \\ 0 & 0 & 2 \end{bmatrix}$$

3. Fit a curve of the form $y = a x + b y^2$ to the data given below:

$x :$	1	2	3	4	5	6
$y:$	2.6	5.4	8.7	12.1	16	20.2

4. Express $T_0(x) + 2 T_1(x) + T_2(x)$ as a polynomial in x .
5. Using Picard's method of successive approximation obtains a solution upto third approximation of the differential equation.

$$\frac{dy}{dx} = x + y^2, \text{ where } y=0 \text{ when } x = 0.$$

6. Use Runge-Kutta method to approximate y , when $x = 0.1$ and $x = 0.2$ given that $x = 0$ when $y = 1$ and $\frac{dy}{dx} = x + y$.
7. Give solution of boundary value problem of type $y'' = (x, y, y')$.
8. Solve the following simultaneous linear equation using Gauss Jordan method :

$$3x + y + z = 6$$

$$x + 2y + 3z = 8$$

$$2x + y + 4z = 8$$

Section 'B'

भाग ख

- Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answer 02 questions only.

1. Solve $x^3 - 8x^2 + 17x - 10 = 0$, by using Graeffe's method.
2. Use Milne's method to solve $\frac{dy}{dx} = x + y$ with initial condition $y(0) = 1$ from $x = .20$ to $x = .30$.
3. Solve the boundary value problem $\frac{d^2y}{dx^2} = y$
 $y(0) = 0, y(0.6) = 0.7$ by shooting method.
4. By Jacobi's method find the eigen values of the matrix

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{bmatrix}$$