D.K.M.COLLEGE FOR WOMEN (AUTONOMOUS),VELLORE-1.

NUMERICAL METHODS

UNIT – I SECTION-A (2 MARKS)

1. Define transcendental equation.
2. What is Bisection method?
3. Explain Regular falsie method
4. Define newton raphson method
5. Find the square root of 20
6. What is generalized hewton – Raphson method?

SECTION-B 10 Marks

1. Find the Positive root of $x^4-x^3-2x^2-6x-4 = 0$ correct to 4 decimal places by bisection method.
2. Solve the equation $x^3-9x +1 = 0$ for the root lies between 2 and 3.
3. Solve the equation $x^3-4x+1 = 0$, by regular falsi method.
4. Find the root of x3- x – 1 = 0 by newton's method.
5. Find a double root of the equation $x^3 -x^2- x + 1 = 0$ and the root is nearer to 0.8

UNIT – II SECTION-A (2 marks)

1. Explain the forward difference formula.
2. Explain the backward difference formula.
3. Prove that $\mu= ½ [E ½ + E - ½]$
4. P.T $s = E\ 1/2 - E^{-1/2}$
5. P.T (i) $\nabla=1-E^{-1}$, (ii)$ke^2 = 1+ s^2 /4$
6. If

x	10	15	20	25	30	35
y	19.97	21.51	22.57	23.52	24.65	25.89

Form the difference table and find value of $\Delta^2 y_{10}$, Δy_{20}, $\Delta^3 y_{15}$, $\Delta^5 y_{10}$.

7. Define Lagrange's Interpolation Formula For unequed intervals,
8. Define inverse interpolation formula.
9. prove the Δ is linear.
10. Explain newton's general interpolation formula.

SECTION-B (10marks)

1. Estimate the population 1964 and 1966 form the following data.

year	1961	1962	1963	1964	1965	1966	1967
production	200	200	260		350		430

2. From the following data find θ at x=43, x=84

x	40	50	60	70	80	90
θ	184	204	226	250	276	304

3. use largrange's interpolation formula find y (10) for the following data

x	5	6	9	11
y	12	13	14	16

4. using newtons divided different formula find the value of f(2) ,f(8), &f(15)

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

UNIT-III SECTION-A (2 marks)

1. Explain newton's Forward difference interpolation formula.
2. Explain newton's backward difference interpolation formula.
3. Derive Simpsons one third rule.
4. Derive trapezoided rule.

SECTION-B (10 marks)

1. from the following values of x & y obtain dy/dx,d^2y/dx^2 for x=1.2 and x=2.2

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

2. Evaluate $\int_{-3}^{3} x^2$ taking 6 interval using
3. (1) Trapezoidal rule (2) simpsory 1/3 rd rule (3) Simpsons 3/8 the rule.Find the minimum value of f(x) which as values

x	0	2	4	6
f(x)	3	3	11	27

UNIT-IV SECTION-A (2 marks)

1. Derive Gauss Elimination method.
2. define factoriazation method.

(10arks)

1. Solve by Gauss Elimination method.
   3x+2y+4z=7, 2x+y+z=7, x+3y+5z=2.
2. Solve the Equations by Factoraization method .
   2x+3y+z=9, x+2y+3z=6, 3x+y+2z=8

UNIT-V SECTION-A (2 marks)

1. Derive taylors formula.
2. What is picards method.
3. Derive Euler's method.
4. Explain Range-Kutta method

SECTION-B (10 Marks)

1. Using faylors method, compute y(0.2) and (0.4) correct to 4 decimal places given $\frac{dy}{dx}$ =1-2xy and y(0)=0.1
2. Given $\frac{dy}{dx}$=x^3+y, y(0)=2, compute y(0.2),y(0.4),y(0.6) by Range-kutta method of order two.