GOVERNMENT COLLEGE FOR WOMEN(AUTONOMOUS),SRIKAKULAM
REACCREDITED WITH NAAC 'A' GRADE

B.Sc (Regular) Semester-III
(2023-24 Admitted Batch)

Paper : **Numerical methods and problem solving sessions**   **Time : 3 Hrs**
Marks : **60**   **Date : 10-12-2024**

SECTION –A

Answer ALL of the following question: **5X8M=40M**

1(a) Prove that $(\Delta+1)(1-\nabla)=1$ II)P.T.$\Delta\nabla=\Delta-\nabla$ III) Prove that $\nabla=1-\nabla-1$

OR

(b) State and Prove Fundamental Theorem of Difference Calculus

2.(a) State and Prove Newton Forward Formula

OR

(b)The function y=f(x) is given at the point (7,3) (8,1),(9,1) and (10,9) find f(9.5) using Lagrange,s formula

3.(a) Use Gauss's forward formula to find y30 for the following data y21= 18.4708 ,y25= 17.8144, , y29=17.1070,y33=16.3432,y37=15.5154 .

OR

(b) State and Prove Stirlings formula

4.(a) Explain Method of False Position

OR

(b) Solve x3=2x+5 for a positive root by iteration method

5.(a) Write a procedure for fitting a straight line

OR

(b) Fit a Second degree polynomial to the following data by the method of least squares

x	10	12	15	23	20
y	14	17	23	25	21

SECTION-B

Answer any FIVE of the following questions   **5X4M=20M**

6.Find the missing terms of the following data

x:	0	1	2	3	4	5
y:	0	-	8	15	-	35

7.Prove That

$$\mu^2 = 1 + \frac{1}{4}\delta^2$$

8.Use Newton's divided difference formula to find f (4) from the following table

x:	1	2	4	8	10
y:	0	1	5	21	27

9.Given f(0)=3 f(1)=12 f(2)=81 f(3)=200 f(4)=100 and f(5)=8 form a difference table and find $\Delta^5 f(0)$

10.State and Prove Gauss Backward formula

11.Find by Gauss's backward forward the sales of a concern for the year 1936 given that

x:	1901	1911	1921	1931	1941	1951
y:	12	15	20	27	39	52

12.Find a root of the equation x3-5x+1=0 using the bisection method in 5 stage

13.Explain Newton –Raphson's method

14. Determine the constants a and b by the method of least squares such that y=ae^{bx}

15. Explain Procedure for Power function