MATHEMATICS MODEL PAPER SRI A.S.N.M. GOVERNMENT COLLEGE(A), PALAKOL. W.G.DT

(Affiliated to Adikavi Nannaya University, Rajahmahendravaram

SEMESTER VI Paper –VIII- B-1:

Cluster Elective - VIII –B - 1: ADVANCED NUMERICAL ANALYSIS

Time: 3 hours

Maximum Marks: 75

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SECTION - A

Answer any FIVE of the following questions. Each carries FIVE marks. 5 x 5 = 25 M

1) Fit the line y = a +bx using the following data using least square method

Х	0	1	2	3
Y	2	5	8	11

- 2. Prove that $E = e^{hD}$
- 3. From the following table, find the value of x for which y is maximum and find this value of y

Х	1.2	1.3	1.4	1.5	1.6
e ^x	0.932 0	0.9636	0.9855	0.9975	0.9996

4. Evaluate $_0 \int_{-5}^{5}$ by using Traezoidal rule.

- 5. Evaluate $4 \int 5.2 \log x \, dx$ by using Weddle's rule.
- 6. solve the equations $2X_1+X_2+X_3=10$, $3X_1+2X_2+3X_3=18$, $X_1+4X_2+9X_3=16$; Using Gauss elimination Method
- 7. Using Taylor series method, solve the equation $dy/dx = (x^2+y^2)$ for x=0.4 given that y=0 when x=0
- 8. Solve by Euler's method, $dy/dx=x+y^2$, y(0)=1 and find y(0.3) with h=0.1

SECTION - B

Answer any FIVE questions at least two from each part. Each question carries Ten marks: 5 X 10 = 50 M

PART – I

- 9. Derive the normal equations to fitting a second degree polynomial.
- 10. Determine the constants a and b by the method of least squares such that y=ae^{bx}

Х	2	4	6	8	10
Y	4.077	11.084	30.128	81.897	222.62

11. Using the given table, find dy/dx and d^2y/dx^2 at x= 1.1

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
У	7.989	8.403	8.781	9.129	9.451	9.750	10.031

12. Find f(0.6) and f'(0.6) from the following table :

X	0.4	0.5	0.6	0.7	0.8
f(x)	1.583 6	1.7974	2.0442	2.3275	2.6510

13. Obtain general formula for Quadrature. And hence derive Trapezoidal Rule

PART-II

- 14. Find the value of the integral $_0\int^1$ by using Simpson's $1/3^{rd}$ and $3/8^{th}$ rule. Hence obtain the approximate value of π in each case.
- 15. Solve the following system of equations by using Gauss- Seidel method Correct to three decimal places 10x+2y+z=9, 2x+20y-2z= -44, -2x+3y+10z=22;
- 16. Solve the following system of equations by using Gauss- Jacobi method Correct to three decimal places.

8x - 3y + 2z = 20; 4x + 11y - z = 33; 6x + 3y + 12z = 35;

- 17. Use the Euler's modified method find y at x=0.02 by taking h=0.01 for the differential equation $dy/dx = x^2+y$ and y (0)=1.
- 18. Apply the fourth order R-K method to find y(0.1) and y(0.2), given $dy/dx = xy+y^2$, y(0)=1