Paper Code: 6124 Regd. No

SRI Y.N.COLLEGE (AUTONOMOUS)–NARSAPUR, W.G.Dt.

(Affiliated to Adikavi Nannaya University)

III B.Sc., Degree Examinations, Mar/Apr 2018

(At the end of 6th Semester)

Regular (2015-18 batch)

MATHEMATICS Paper-VIII (CE-I)

(Advanced Numerical Analysis)

Date: 29.03.2018 FN Max Marks:75

Duration: 3 hrs

PART - I

Answer any FIVE of the following questions. Each question carries Five marks **5×5=25M**

1. By the method of least squares, fit a straight line to the following data

x:	1	2	3	4	5
y:	14	27	40	55	68

2. Find Normal equations of parabola
3. Find the minimum value of y from the following data

x:	0	2	4	6
y:	3	3	11	27

4. Evaluate $\int_0^5 \frac{dx}{4x+5}$ by using trapezoidal rule.
5. Evaluate $\int_4^{5.2} logdx$ by Weddles rule.
6. Solve the equations x+2y+z=4 , 2x-3y-z=-3 , 3x+y+2z=3 by Gauss Elimination.
7. Solve the system of equations x+y+z=1 ,x+2y+3z=6 , x+3y+4z=6 by using matrin invesion method.
8. Compute y(0.2) upto 4 decimals using Euler method when $\frac{dy}{dx} = 1+y^2$ and y(0) = 0.

PART - II

Answer any FIVE questions. Choosing atleast TWO questions from each Section. Each question carries Ten marks **5×10=50M**

SECTION - A

9. Fit a second degree parabola to the following data

x:	0	1	2	3	4
y:	1	5	10	22	38

10. Find the least square power function of the from $y = ax^b$

x:	1	2	3	4
y:	3	12	21	35

11. Using the following table compute $\frac{dy}{dx}$ & $\frac{d^2y}{dx^2}$ at x=1

x:	1	2	3	4	5	6
y:	1	8	27	64	125	216

12. Find $f^1(1)$ for $f(x) = \frac{1}{1+x^2}$ using the following table

x:	1	1.1	1.2	1.3	1.4
y:	0.5	0.4524	0.4098	0.3717	0.3378

13. Obtain general formula for quadrature and hence derive Simpson's 1/3rd rule.

SECTION – B

14. Using Simpon's 3/8th Rule evaluate $\int_0^1 \frac{1}{1+x}\,dx$ with h=1/6.

15. Solve the following equestions by Jacobi's method.

    27X+6Y-Z=85 , 6X+15Y+2Z=72 , X+Y+54Z=110

16. Solve the following equatins by Gauss seidal method.

    10x+2y+z=9 , 2x+20y-2z=-44 , -2x+3y+10z=22.

17. Given $\frac{dy}{dx}$ = x+y with initial conditions y(0)=1 find y(0.05) and y(0.1) Eulers modified method.

18. Given $\frac{dy}{dx}$ = y-x with y(0)=2 find y(0.1)& y(0.2) using Runge Kutta method of fourth order.

Paper Code: 6124 Regd. No

SRI Y.N.COLLEGE (AUTONOMOUS)–NARSAPUR, W.G.Dt.

(Affiliated to Adikavi Nannaya University)

III B.Sc.,Degree Examinations, Mar/Apr 2019

(At the end of 6th Semester)

Regular (2016 batch)

MATHEMATICS

Paper – VIII **(CE-1)**

(Advanced Numerical Analysis)

Date: 04.04.2019 FN

Duration:3hrs

Max Marks:75

PART-I

Answer any **FIVE** of the following. Each question carries **5** Marks. **5 x 5 = 25 M**

1. Fit a straight line y = a+bx and find y(6) for the following data.

x	0	2	5	7
y	-1	5	12	20

2. Find $f'(2.5)$ from the following table .

x	1.5	1.9	2.5	3.2	4.3	5.9
f(x)	3.375	6.059	13.625	29.368	73.907	196.579

3. Using the following table, compute $\frac{dy}{dx}$ at x = 1.

x	1	2	3	4	5	6
y	1	8	27	64	125	216

4. State and prove Trapezoidal Rule?
5. Evaluate $\int_4^{5.2} logx\, dx$ by using Weddle's rule?
6. Solve the system of equations $3x + y + 2z = 3, 2x - 3y - z = -3,$ $x + 2y + z = 4$ *by* using matrix inversion method.
7. Solve the equations 2x+y+4z=12; 8x-3y+2z=23; 4x+11y-z=33 by Gauss elimination method?
8. Given $\frac{dy}{dx}$ =1+xy with the initial condition that y=1, when x=0. Compute y(0.1) correct to four decimal places by using Taylor's series.

PART-II

Answer any **FIVE** questions. Choosing at least **TWO** questions from each section. Each question carries **10** Marks. **5 x 10 = 50 M**

SECTION – A

9. Fit a second degree parabola to the following data by the method of Least Squares.

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

10. Fit an exponential function of the type $y = ae^{bx}$ to the following data.

x	1	2	3	4	5	6
y	1.5	4.6	13.9	40.1	125.1	299.5

11. From the following table, find 'x' for which 'y' is maximum and find this value of y.

x	1.2	1.3	1.4	1.5	1.6
y	0.9320	0.9636	0.9855	0.9975	0.9996

12. Find the value of the integral $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's $1/3^{rd}$ and $3/8^{th}$ rule. Hence obtain the approximate value of π in each case.

13. Evaluate $\int_0^{\frac{\pi}{2}} sinx\, dx$ by using Euler-Maclaurin's formula.

SECTION – B

14. Solve the equations $3x+2y+4z = 7$; $2x+y+z = 7$; $x+3y+5z = 2$ by LU decomposition method?

15. Solve the equations by Gauss-Seidel method $27x+6y-z=85$, $6x+15y+2z=72$, $x+y+54z=110$.

16. Given $\frac{dy}{dx}=\frac{y-x}{y+x}$ with $y=1$, when $x=0$. Find approximately the value of y for $x=0.1$ by Picard's method?

17. Using Euler's modified method, find $y(0.2)$ for $\frac{dy}{dx} = x + |\sqrt{y}|$ with $y(0) = 1$.

18. Given $\frac{dy}{dx}$ = y-x with $y(0)=2$, find $y(0.1)$ and $y(0.2)$ correct to four decimal places by using Runge-Kutta fourth order method.

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Paper Code: 6124 Regd. No

SRI Y.N.COLLEGE (AUTONOMOUS)–NARSAPUR, W.G.Dt.

(Affiliated to Adikavi Nannaya University)

III B.Sc., Degree Examinations, September 2020

(At the end of 6th Semester)

Regular (2017 batch), Supplementary (2016 batch)

MATHEMATICS Paper – VIII (CE-1)

(Advanced Numerical Analysis)

Date: 18.09.2020 Max Marks:75

Duration:3hrs

PART-I

Answer any FIVE questions. Each question carries FIVE marks. 5 x 5 = 25M

1. By the method of least squares, fit a stright line to the following data

x	1	2	3	4	5
y	14	27	40	55	68

2. Using the following table compute $\frac{dy}{dx}$ at $x=1$.

x	1	2	3	4	5	6
y	1	8	27	64	125	216

3. Find $f^1(5)$ from the following table

x	1	2	4	8	10
$f(x)$	0	1	5	21	27

4. Evaluate $I=\int_{-3}^{3} x^4\,dx$ by Trapezoidal rule with h= 1.

5. Evaluate $\int_0^1 \frac{1}{1+x}\,dx$ by Boole's rule.

6. Solve the equations $3x+2y+4z=7;\ 2x+y+z=7;\ x+3y+5z=2$ by matrix inversion method.

7. Solve the equations $x+y+z=9,\ 2x+5y+7z=52,\ 2x+y-z=0$ by Cramers rule.

8. Solve the differential equation $\frac{dy}{dx}=x+y$ with $y(0)=1,\ x\in[0,1]$ by Taylors series expansion to obtain y for $x=0.1$.

PART - II

Answer any FIVE questions. Choosing atleast TWO questions from each section. Each question carries 10 marks. 5 x 10 = 50M

Contd

SECTION - A

9. Fit an exponential curve of theform $y = ab^x$ to the following data

x	1	2	3	4	5	6	7	8
y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

10. Fit a second degree parabola to the following data.

x	0	1	2	3	4
y	1	5	10	22	38

11. Find the maximum and minimum values of the function $y = f(x)$ from the following data.

x:	0	1	2	3	4	5
$f(x)$:	0	0.25	0	2.25	16	56.25

12. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by Simpson's rule.

13. Use Euler-Maclaurins formula with n = 4 to estimate $\int_0^1 \frac{1}{1+x^2}\,dx$ and hence find the approximate value of π.

SECTION - B

14. Solve the equations $2x+3y+z=9,\ x+2y+3z=6,\ 3x+y+2z=8$ by factorisation method.

15. Solve by Gauss-Seidal method the equations $10x_1 + x_2 + x_3 = 12,\ 2x_1 + 10x_2 + x_3 = 13,$ $2x_1 + 2x_2 + 10x_3 = 14$.

16. Solve $\frac{dy}{dx} = 1+y^2,\ y(0) = 0$ by Picard's method.

17. Solve $\frac{dy}{dx} = xy$ using Runge-Kutta method for $x = 0.2$ given that $y(0) = 1$ taking $h = 0.2$.

18. Determine the value of y when $x = 0.1$ given that $y(0) = 1$ and $\frac{dy}{dx} = x^2 + y$. by using Modified Euler's method

Paper Code: 6124 Regd. No. | | | | | | | | |

SRI Y.N.COLLEGE (AUTONOMOUS)–NARSAPUR, W.G.Dt.

(Affiliated to Adikavi Nannaya University)

III B.Sc/B.Com/B.B.A/B.A., DegreenExaminations, June 2022

(At the end of 6th Semester)

Regular (2019-22 batch), Supplementary (2018,2017,2016 batches)

MATHEMATICS Paper – VIII (CE-1)

(Advanced Numerical Analysis)

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Date: 20.06.2022 FN Max Marks:75

Duration:3hrs

PART-I

Answer any FIVE questions. Each question carries 5 marks. 5 X 5 = 25M

1. Find the least square line y = a+bx for the following data.

X	1	2	3	4	5
Y	14	27	40	55	68

2. Using the following table, compute $\frac{dy}{dx}$ at x=1.

X	1	2	3	4	5	6
Y	1	8	27	64	125	216

3. Find $f^{l}(2.5)$ from the following table.

X	1.5	1.9	2.5	3.2	4.3	5.9
Y	3.375	6.059	13.625	29.368	73.907	196.579

4. Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal rule.
5. Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ using Weddle's rule.
6. Solve the system of equations $x + 2y + z = 4,\ 2x - 3y - z = -3,\ 3x + y + 2z = 3$ by Gauss elimination method.
7. Solve the system of equations $5x + 2y + z = 12,\ x + 4y + 2z = 15, x + 2y + 5z = 20$ by Gauss-Jordanmethod.
8. Compute y(0.2) up to 4 decimals, using Euler's method when $\frac{dy}{dx} = 1 + y^2$ and y(0) = 0.

PART-II

swer any FIVE questions. Choosing at least TWO questions from each section.

ach question carries 10 marks. **5 x 10 = 50M**

SECTION-A

9. Fit an exponential curve of the form $y = ab^x$ to the following data.

X	1	2	3	4	5	6	7	8
Y	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

10. Fit a second-degree parabola to the following data.

X	0	1	2	3	4
Y	1	5	10	22	38

11. Find the maximum and minimum values of the function y = f(x) from the following data.

X	0	1	2	3	4	5
Y	0	0.25	0	2.25	16	56.25

12. State and prove general quadrature formula and hence deduce Simpson's 3/8 rule.

13. Evaluate $I = \int_0^{\pi/2} sinx\ dx$ using Euler-Maclaurin's formula.

SECTION-B

14. Solve the system of equations $x + 2y + 3z = 14, 2x + 5y + 2z = 18, 3x + y + 5z = 20$ by usingfactorization method.

15. Solve the equations $10x + y + z = 6, x + 10y + z = 6, x + y + 10z = 6$ by using Gauss Seidel method.

16. Use Picard's method to approximate y when x = 0.2 given that y = 1 when x = 0 and $\frac{dy}{dx} = x - y.$

17. Use Runge Kutta method of fourth order to find an approximate value of y when x = 0.1 and x = 0.2 given that $\frac{dy}{dx} = x + y,\ y(0) = 1.$

18. Using Euler's modified method, find y(0.2) for $\frac{dy}{dx} = 2 + \sqrt{xy}$ with y(1) = 1.