B.Sc. DEGREE EXAMINATION,APRIL 2020
II Year IV Semester
Numerical Methods

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Write the relation between E and Δ
2. When to use Newton's Forward Formula?
3. What is the Lagrange's formula to find y, if 3 sets of values of (x_0, y_0), (x_1, y_1), (x_2, y_2) are given?
4. What is the assumption we make when Lagrange's formula is used?
5. Write down the formula for Everett's Central Difference formula.
6. Give the formula for Gauss Backward difference formula.
7. What is Inverse interpolation?
8. The iterative formula for Newton – Raphson method is _____.
9. State Simpson's $\frac{1}{3}$ and $\frac{3}{8}^{th}$ rule.
10. State the basic principle for deriving Simpson's $\frac{1}{3}$ rule.
11. What is the criterion for the convergence in Newton-Raphson method?
12. Give two direct methods to solve a system of linear equations.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Explain the properties of difference operators.
14. Using Lagrange's formula, find the polynomial to the given data:

X:	0	1	3
Y:	5	6	50

15. From the following table, find f(34) using Everett's formula

x:	20	25	30	35	40
y= f(x)	11.4699	12.7834	13.7648	14.4982	15.0463

16. Find x corresponding to y = 85, given

x:	2	5	8	14
y:	94.8	87.9	81.3	68.7

17. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule with h=0.2.
18. Explain how to construct a divided difference table with an example.
19. Find θ at $x = 43$ from the following data:

x:	40	50	60	70	80	90
θ :	184	204	226	250	76	304

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. The following data are taken from the steam table.

Temp:	140	150	160	170	180
Pressure:	3.685	4.854	6.302	8.076	10.225

Find the pressure at temperature t=142 and t = 175 degrees.

21. Using Newton's divided difference formula, find the values of f(2) and f(8) , given the following table:

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

22. From the following table, Using Stirling's formula, estimate the value of tan 16

x :	0	5	10	15	20	25	30
y= tan x:	0.0	0.0875	0.1763	0.2679	0.3640	0.4663	0.5774

23. Find the real root of $X^3 - 2X - 5 = 0$ using Newton Raphson method.
24. Compute f^1 (0) and $f^{11}(4)$ from the data given below:

x:	0	1	2	3	4
y:	1	2.718	7.381	20.086	54.598

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