B.Sc. DEGREE EXAMINATION,NOVEMBER 2018
II Year IV Semester
Allied Paper IV
NUMERICAL METHODS

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

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

Answer any **TEN** questions

1. State the relation between $\triangle$ **and E.**
2. State the formula for $\triangle$**f(x).**
3. Prove that divided difference operator is linear.
4. State the Lagrange's formula for interpolation.
5. State the Gauss's backward interpolation formula.
6. State the formula for Everett's.
7. Write the order of convergence for Newton's formula.
8. Define Gauss Elimination method.
9. Write the formula for Trapezoidal Rule.
10. State the formula for Simpson's one third rule
11. Define Interpolation.
12. State the formula for Bessel's.

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

Answer any **FIVE** questions

13. Find the value of y at x=21 from the following data

X:	**20**	**23**	**26**	**29**
Y:	**0.3420**	**0.3907**	**0.4384**	**0.4848**

14. Using Newton's divided difference formula, find the value of f(2) from the following table

X:	**4**	**5**	**7**	**10**	**11**	**13**
F(x):	**48**	**100**	**294**	**900**	**1210**	**2028**

15. Apply Gauss's central difference formula and estimate f(32) from the following table

X:	**25**	**30**	**35**	**40**
Y:	**0.2707**	**0.3027**	**0.3386**	**0.3794**

16. Find the positive root of x= cosx using Newton's method.
17. State and prove Simpson's three eight formula.

18. Solve the following system of equations by Gauss's-Seidel method(correct to three decimal places and up to two iterations)

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

19. From the data given below, find the value of x when y=13.5

X:	**93**	**96.2**	**100**	**104.2**	**108.7**
Y:	**11.38**	**12.80**	**14.70**	**17.07**	**19.91**

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

Answer any **THREE** questions

20. From the following table of half yearly premium for policies maturing at different ages, estimate the premium for the policies maturing at 63.

AGE X:	**45**	**50**	**55**	**60**	**65**
PREMIUM Y:	**114.84**	**96.16**	**83.32**	**74.48**	**68.48**

21. Using Lagrange's formula of interpolation find y(9.5) given

X:	**7**	**8**	**9**	**10**
Y:	**3**	**1**	**1**	**9**

22. Find y(35) by using stirling's formula and Bessel's formula

X:	**20**	**30**	**40**	**50**
Y:	**512**	**439**	**346**	**243**

23. Solve the following system of equations by Gauss's elimination method

    X+2Y+Z=3 ,2X+3Y+3Z=10 ,3X-Y+2Z=13 .

24. Evaluate I= $\int_0^6 \frac{1}{1+x}$ using simpson's one third and three eight rule

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