

B. PRINTING ENGINEERING
2nd Year, 1st Semester Supplementary Examination, 2017

COMPUTATIONAL STUDIES

Time- Three Hours

Full Marks-100

Answer *Question no. 1* and *any four* from the rest

1. (i) Answer all questions: (4x5) =20
- a) What do you mean by Numerical Integration?
 - b) Write down geometrical interpretation of Simpson's 1/3rd rule.
 - c) Derive the equivalence between Lagrangian and Newtonian interpolations.
 - d) Derive Newton's Forward difference.
2. a. Derive the Cote's coefficient using Lagrangian Interpolation formula.
b. Evaluate $\int_0^{\pi/2} \sin x \, dx$ using Trapezoidal rule. Take $h = \pi/20$.
- 5+15=20
3. a. Derive the divided difference of nth order?
b. Construct the difference table from the following table and compute $f(21)$ by Newton's backward formula.

x	0	5	10	15	20
$f(x)$	1.0	1.6	3.8	8.2	15.4

5+15=20

4. a. How do you find out real roots of an equation $f(x) = 0$ using Newton-Raphson method?

b. Solve the following equations by Gauss-elimination method

$$A - B - C = 1$$

$$2A - 3B + C = 1$$

$$3A + B - C = 2$$

5+15=20

5. a. What are the advantages and disadvantages of Lagrangian Interpolation formula?

b. Find by Lagrangian interpolation formula the interpolating polynomial which corresponds to the following data:

x	-1	0	2	5
$f(x)$	9	5	3	15

5+15=20

6. Write down the algorithms for the followings

a. Crammer's Rule

b. Secant Method

10+10=20