SEMESTER-IV

NUERICAL METHODS-IV

(Semester-IV) Maximum Marks: 36

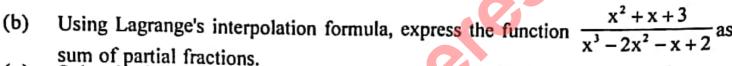
Time Allowed: Three Hours Note: Attempt two questions each from Sections A and B carrying 5½ marks each, and the entire Section C consisting of 7 short answer type questions carrying 2 marks each.

SECTION-A Use Regula-Falsi method to find a real root of $x^3 - 2x - 5 = 0$ correct to four decimal Ī. (a) Using Triangularisation Method solve the equations: $2x_1 + 3x_2 + 2x_3 = 3$ (b) $10x_1 + 3x_2 + 4x_3 = 16$ $3x_1 + 6x_2 + x_3 = -6$ Find the order of convergence of Newton-Rapson method. Find a real root of the equation $x^2 - 4x - 9 = 0$ by Bisection method correct to three 11. (a) (b) (3+2%=5%)decimal places. Find the smallest root of the equation III. (a) Solve the following system of equations by Gauss Seidel method (b) 5x + 2y + z = 12 x + 4y + 2z = 15 x + 2y + 5z = 20(3+2%=5%)Find the order of convergence of Regula Falsi method. Find a root of equation $x^3 - x - 10 = 0$ using Secant method. IV. (3+2%=5%)SECTION-B State and proof Newton-Gregory backward formula. (a) V. Find the polynomial f(x) by using Lagrange's formula and hence find f(3) for (b) 147 Find a polynomial using Bessel's interpolation from the table below: VI. (a) Using Newton's forward interpolation formula show that (b) (3+2%=5%)State and proof Lagrange's Interpolation formula VII. (a) (b) Using Everett's formula to evaluate f(30)If f(2) = 2854, f(28) = 3162, f(36) = 7088, f(44) = 7984. $(3+2\frac{1}{2}=5\frac{1}{2})$ Using Sterling formula, find y_{35} given that $y_{35} = 346$, $y_{35} = 243$. Use Newton backward formula to estimate the number of students who obtained VIII. (a) marks between 20 and 25 50 325 30 10 Marks: No. of Students: 115 210 45

> SECTION-C (Compulsory Question)

Attempt all the questions: Obtain the function whose first difference is (a) $9x^2 + 11x + 5$.

(3+2½=5½)



Solve the following system of equation by Gauss elimination method 3x + 4y + 5z = 40 2x - 3y + 4z = 13 x + y + z = 9. (c)

(d) (e) Mention the drawbacks of Newton Rapson method Using iteration method, find a root of the equation $x^3 + x^2 - 1 = 0$ correct to four decimal places

(f) Evaluate Δ^2 (cos 2x).

Find the iteration formula for finding $\frac{1}{N}$ for some positive real number N using (g) Newton-Rapson method. $(7 \times 2 = 14)$