B.Sc. EXAMINATION: October - 2015

SEMESTER-IV

PAPER NO.:M-403 NUMERICAL ANALYSIS CODE NO:3838

TIME:2 :30HOURS TOTAL MARKS:70

INSTRUCTIONS(1)ALL QUESTIONS ARE COMPULSORY.
(2)EACH QUESTION CARRY EQUAL MARKS.

Q.1 A Derive differentiation formula based on Newton's backward interpolation formula. [7]

B Find y'(0.45) and y''(0.45) from the following table. [7]

X	0.35	0.40	0.45	0.50	0.55
Y	1.521	1.506	1.488	1.467	1.444

OR

Q.1 A Find the 1st 2nd and 3rd derivatives of f(x) at x = 2.5 using Newton's forward formula [7]

X	2.5	3.0	3.5	4.0	4.5	5.0
f(x)	3.375	7.000	13.625	24.000	38.875	59.000

B Derive differentiation formula based on stirling formula. [7]

Q.2 A Derive simpson's $\frac{1}{3}^{rd}$ rule. [7]

B Using trapezoidal rule evaluate $\int_2^{3.2} \log x \, dx$ approximately using step of 0.2 [7]

OR

Q.2 A Evaluate : $\int_1^4 (x^3 - 2x + 3)dx$ by dividing the interval into six equal parts by simpson's $\frac{3}{8}^{th}$ rule [7]

B Derive : Weddle's Rule [7]

Q.3 A Derive: $Q_{11}(0)$ [7]

B Discuss symbol for integration formula [7]

OR

Q.3 A Discuss : NEWTON COTES' FORMULA [04]

B Derive : Euler- Maclaurin's formula [10]

Q.4 A Discuss: The method of false position [7]

B using Bisection method,find the real root of : $f(x) = x^3 - 5x - 6$ correct upto three decimal places [7]

OR

Q.4 A Derive Method of false position ,derive the formula for finding p^{th} root of positive number N. [7]

B Discuss : Iteration method [7]

Q.5 A If y_x satisfies the differential equation : $y' = \frac{1}{2}(x + y)$, given that , $y(2.1) = 2.1406, y(2) = 2.1147$ $y(2.2) = 2.1657, y = (2.3) = 2.1899$ then find $y(2.4)$ using Milne's method [7]

B Derive Picard's method [7]

OR

Q.5 A Derive Euler's modified method [7]

B Using Taylor's series method ,solve : $\frac{dy}{dx} = x - y^2$ with initial condition Y(0)=1.compute y(0.1) correct upto three decimal places [7]