B.Sc. EXAMINATION:MARCH / APRIL- 2016

SEMESTER-IV

NUMERICAL ANALYSIS

PAPER NO.:M-403 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 forward interpolation formula. [7]

B Obtain the value of f '(90) using strling formula to the following data. [7]

x	60	75	90	105	120
f(x)	28.2	38.2	43.2	40.9	37.7

OR

Q.1 A Derive differentiation formula based on stirling formula. [7]

B Find y'(6) and y''(6) from the following table. [7]

X	2	3	4	5	6	7
Y	4	8	15	7	6	2

Q.2 A Derive : Trapezoidal rule [7]

B Evaluate $\int_2^4 x^2\,dx$ using Simpson's $\frac{1^{rd}}{3}$ rule, where h = 0.50 [7]

OR

Q.2 A Derive simpson's $\frac{3}{8}^{th}$ rule. [7]

B Find the approximate value of $\int_0^{\frac{\pi}{2}} \sin\theta\,d\theta$ by dividing the interval into six equal parts by Weddle's Rule [7]

Q.3 A Discuss symbol for integration formula [7]

B Evalute $\int_0^1 x^2 + 1\,dx$ correct upto three decimal places by Euler- Maclaurins formula [7]

OR

Q.3 A Prove : $Q_{31}(1) = \frac{h}{24}\{-1,13,13,-1\}$ [7]

B Derive :- $Q_{22}(0)$ [7]

Q.4 A Derive Newton-Raphson formula. [7]

B using method of Iteration, Solve the equation : [7]
$f(x) = x^3 + x^2 - 1 = 0$ correct upto three decimal places.

OR

Q.4 A Discuss: Bisection method. [7]

B Derive: The method of false position [7]

Q.5 A Given the differential equation for Runge-Kutta 2nd order $\frac{dy}{dx} = y + x$ with y(0) =1 ,find y(0.2) whenever h = 0.1. [7]

B Discuss Euler's method. [7]

OR

Q.5 A Discuss : Taylor's series method [7]

B Using Euler's modified method , solve $\frac{dy}{dx} = 2x^2 + y$, y(0) =1 , compute y(0.1) and y(0.2)whenever h = 0.1. [7]