

FACULTY OF SCIENCE**B.Sc. VI-Semester (CBCS) Examination, May / June 2019****Subject : Mathematics****Paper – VII (DSC) : Numerical Analysis****Time : 3 Hours****Max. Marks: 60****PART – A (5 x 3 = 15 Marks)****(Short Answer Type)****Note : Answer any FIVE of the following questions.**

- 1 Explain Bisection Technique to find the root of given equation $f(x) = 0$.
- 2 Determine the number of iterations necessary to solve $f(x) = x^3 + 4x^2 - 10 = 0$ with accuracy using $a_1 = 1$ and $b_1 = 2$.
- 3 Construct the divided difference table for the following data.

x	1	1.3	1.6	1.9	2.2
f(x)	0.7651977	0.6200860	0.4554022	0.2818186	0.1103623
- 4 Write Algorithm for Neville's method.
- 5 Use the forward difference formula to approximate the derivative of $f(x) = \log x$ at $x_0 = 1.8$ using $h = 0.1$ and $h = 0.01$ determine bounds for the approximation errors.
- 6 Derive Simpson's $1/3^{\text{rd}}$ rule.
- 7 Explain the secant method and its geometrical interpretation.
- 8 Let $P_3(x)$ be the interpolating polynomial for the data $(0, 0)$, $(0.5, y)$, $(1, 3)$ and $(2, 2)$. The coefficient of x^3 in $p_3(x)$ is 6, find 'y'.

PART – B (3 x 15 = 45 Marks)**(Essay Answer Type)****Note: Answer ALL from the questions.**

- 9 (a) (i) Explain about Newton's method and its geometrical interpolation.
(ii) Find the approximation to within 10^{-4} to all the real zeros of the polynomials $f(x) = x^3 - 2x^2 - 5$ using Newton's method.

OR

- (b) Explain False position method and use it to find a solution to $x = \cos x$ with $p_0 = 0.5$ and $p_1 = \pi/4$.