Roll No.												
----------	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non-Medical) (2018 Batch) (Sem.–2) THEORY OF EQUATIONS Subject Code : BSNM-206-18 M.Code : 76304 Date of Examination : 24-12-22

Time: 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Write briefly :

- a) Define floating point number.
- b) Use synthetic division to compute f(-2) where $f(\underline{x}) = x^4 12x^2 + 40x 71$.
- c) Without actual division, find the remainder when $x^3 + 7x^2 x + 1$ is divided by x + 1.
- d) Find the roots of the equation $x^3 12x^2 + 44x 48 = 0$, given that the roots are in A.P.
- e) Find the absolute error if the number X= 0.00545828 is truncated to three decimal digits.
- f) Form an equation whose roots are the roots of the equation $x^4 3x^2 + 7x 1 = 0$ with their signs changed.
- g) What is the nature of convergence of Newton's method?
- h) Show that $x^3 + 3x + 2 = 0$ has two non-real roots.
- i) If there is only one change in sign in f(x), then how many positive root (s) will f(x) have?
- j) What do you mean by rate of convergence?

SECTION-B

- 2. Discuss various types of errors and their sources.
- 3. Find the iterative formula or finding \sqrt{N} , where N is a real number, using Newton-Raphson formula. Hence evaluate $\sqrt{10}$.
- 4. Solve the equation $x^4 + 6x^3 9x^2 + 18x 36 = 0$, given that two of its roots are purely imaginary and the other two are real.
- 5. Use Cardon's method to solve $x^3 18x 35 = 0$
- 6. Remove the second term from the equation $x^4 16x^3 + 86x^2 176x + 105 = 0$ and hence solve it completely.

SECTION-C

- 7. a) Show that the equation has $x^n a = 0, a > 0$
 - i) Exactly two real roots if n is even.
 - ii) Exactly one real root if n is odd.
 - b) Prove that in an equation with real coefficients, imaginary roots always occur in conjugate pairs.
- 8. Use Ferrari's method to solve the equation $2x^4 + x^3 + 2x^2 3x 2 = 0$.
- 9. a) Find the root of the equation $\cos x = xe^x$ using the method of False position correct to four places of decimal.
 - b) Find a root of the equation $x^3 4x 9 = 0$? using bisection method correct to three decimal places.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.