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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non Medical) (Sem-2)

THEORY OF EQUATIONS

Subject Code : BSNM-206-18

M.Code : 76304

Date of Examination : 05-06-2023

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) Compute the discriminant of $x^3 + px + q = 0$.
- b) Discuss the nature of roots of equation $x^3 - 9x - 6 = 0$.
- c) Solve of equation $x^3 + 6x + 20$, one root being $3i + 1$.
- d) Express $f(x) = x^3 - 6x^2 + 8x + 7$ as a polynomial in powers of $(x + 3)$.
- e) Prove that equation $x^3 + 3x + 2$ has two non real roots.
- f) Find decimal number corresponding to binary number $(111.011)_2$
- g) What do you mean by numerical instability?
- h) Using Regula falsi method compute the smallest positive root of equation $xe^x - 2 = 0$.
- i) Evaluate $\sqrt{12}$ to four decimal places by Newton Raphson method.
- j) Compare Bisection method with Regula falsi method.

SECTION-B

2. Solve the equation $x^4 - 4x^3 - 6x^2 + 36x - 27 = 0$ given that it has multiple root.
3. Solve $x^3 - 3x^2 - 12x + 16 = 0$ by Cardan's method.
4. State Discrete's rule of signs. Find least possible number of imaginary roots of equation $x^9 - x^5 + x^4 + x^2 + 1 = 0$
5. Find smaller root of equation $x^2 - 400x + 1$ using four digit arithmetic.
6. Use secant method to determine the root of equation $\cos x - xe^x = 0$.

SECTION-C

7. Solve by Ferrari's method the equation $2x^4 + 6x^3 - 3x^2 + 2 = 0$.
8. Find condition that second and fourth terms of equation $a_0x^2 + 4a_1x^3 + 6a_2x^2 + 4a_3x + a_4 = 0$ may be removed by same transformation. Hence solve the equation $x^4 + 16x^3 + 83x^2 + 152x + 84 = 0$.
9. Find the rate of convergence of Secant method.

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.