

Roll No.

Total No. of Pages : 02

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B.Sc.(Non Medical)(2018 Batch)(Sem.-2)

THEORY OF EQUATIONS

Subject Code :BSNM-206-18

M.Code :76304

Date of Examination : 16-07-22

Time : 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark 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) Show that the equation $x^8 - x^3 + x^2 - x + 1 = 0$ must have at least 4 non-real roots.
- b) Construct a cubic polynomial $f(x)$ having following properties
(i) $f(0) = 1$ (ii) $f(1) = 3$ (iii) Sum of zeros = 2
- c) Round off the numbers 865250 and 37.46235 to four significant figures. Hence compute absolute and relative error in each case.
- d) Convert 55.125 into Binary form.
- e) Define order of convergence of an iterative method.
- f) Discuss the nature of roots of the equation $x^3 + 2x + 1 = 0$.
- g) Solve the equation $32x^3 - 48x^2 + 22x - 3 = 0$, the roots being in A.P.
- h) Find all integral roots of the equation $x^5 + x^4 - x^3 - x^2 - 2x - 2 = 0$.
- i) Remove the second term from $x^4 + 4x^3 + 2x^2 - 4x - 2 = 0$.
- j) Give geometric interpretation of Newton Raphson method.

SECTION-B

2. The solution of a problem is given as 25.35 with relative error atmost 3%.Find the range of values in which the exact value of the solution lies.
3. Find the condition that the roots of the equation $ax^3 + bx^2 + cx + d = 0$, where a is non-zero, may be in A.P.
4. Use Cardan's method to solve $x^3 - 6x - 9 = 0$.
5. Find a real root of the equation $3x - \cos x - 1 = 0$, correct to three decimal places, using Newton-Raphson method.
6. Show that for all values of k , the equation $x^5 + 2x^2 + 3x + k = 0$ has at least two imaginary roots.

SECTION-C

7. a) If α, β, γ are the roots of $x^3 - 12x^2 + 39x - 28 = 0$, find the equation whose roots are $\frac{1}{\alpha-2}, \frac{1}{\beta-2}, \frac{1}{\gamma-2}$.
b) Remove the second term from the equation $x^4 - 16x^3 + 86x^2 - 176x + 105 = 0$ and hence solve it completely.
8. a) Solve $x^4 - 10x^3 + 35x^2 - 50x + 24 = 0$ by Ferrari's Method.
b) Using Cardan's method, show that the roots of the equation $x^3 - 12x + 8 = 0$ are $4\cos\frac{2\pi}{9}, 4\cos\frac{4\pi}{9}, 4\cos\frac{8\pi}{9}$.
9. Use Method of False Position to obtain a root of $x^3 - 2x - 5 = 0$, correct to three decimalplaces.

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.