

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

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) What do you mean by rate of convergence?
- (b) What is the nature of convergence of Newton's method?
- (c) Define floating point number.
- (d) If there is only one change in sign in $f(x)$, then how many positive root (s) will $f(x)$ have?
- (e) Find the absolute error if the number $X= 0.00545828$ is truncated to three decimal digits.
- (f) Without actual division, find the remainder when $x^3 + 6x^2 - 5x + 3$ is divided by $x + 2$.
- (g) Form an equation whose roots are the roots of the equation $x^4 - 3x^2 + 7x - 1 = 0$ with their signs changed.
- (h) Find the roots of the equation $x^3 - 12x^2 + 44x - 48 = 0$, given that the roots are in A.P.
- (i) Use synthetic division to compute $f(5)$ where $f(x) = x^5 - 4x^4 - 7x^3 + 11x - 13$.
- (j) Show that $x^3 + 3x + 2 = 0$ has two non-real roots.

SECTION-B

2. Discuss various types of errors and their sources.
3. Solve $x^3 - 27x + 54 = 0$ using Cardan's method.
4. Solve $x^4 + 15x^3 + 70x^2 + 120x + 64 = 0$ when the roots are in G.P.
5. Find the iterative formula or finding $\sqrt[3]{N}$, where N is a real number, using Newton-Raphson formula. Hence evaluate $\sqrt[3]{28}$.
6. Find the equation whose roots exceed by 2 the roots of the equation $4x^4 + 32x^3 + 83x^2 + 76x + 21 = 0$. Hence find the roots of the equation.

SECTION-C

7. Solve the equation $x^4 + 12x^3 + 54x^2 + 96x + 40 = 0$ by Ferrari's method.
8. (a) Show that the equation $2x^7 + 3x^4 + 3x + k = 0$ has at least four imaginary roots for all values of k .
(b) If the product of two roots of $x^4 + px^3 + qx^2 + rx + s = 0$ is equal to the product of the other two. then show that $r^2 = p^2s$.
9. (a) Find a root of the equation $x^3 - 2x - 5 = 0$ using secant method correct to three places of decimal.
(b) Use the iteration method to find a root of the equation $x^3 + x^2 - 100 = 0$, correct to four 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.