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

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 $r^2 = p^2 s$.

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.