

U.G. 5th Semester Examination - 2020

COMPUTER SCIENCE

[HONOURS]

Discipline Specific Elective (DSE)

Course Code : Com.Sc(H)-DSE-P-502/PR

[PRACTICAL]

Full Marks : 75

Time : 4 Hours

Distribution of Marks:

Experiment : 60

Lab Note Book : 05

Viva-voce : 10

Use C/C++ to write the one of the following codes and that to be allotted on lottery basis.

1. Using Bisection method, find a root of the following equation $x^2 - 4x - 36 = 0$. The result must be correct upto 5 decimal places. Show all the iterations in a tabular form.
2. Using Secant method, find a root of the following equation $x^3 + x - 3 = 0$. The result must be correct upto 5 decimal places. Show all the iterations in a tabular form.

3. Using Regula-Falsi method, find a root of the following equation $x^2 - 4x - 36 = 0$. The result must be correct upto 5 decimal places. Show all the iterations in a tabular form.
4. Using Newton-Raphson, find a root of the following equation $x^3 + x - 3 = 0$. The result must be correct upto 5 decimal places. Show all the iterations in a tabular form.

5. Write a program to integrate the following tabulate below:

x	-0.6	-0.5	-0.4	-0.3	-0.2	-0.1	0	0.1
f(x)	4	2	3	8	4	-2	2	3

6. Consider the following system of linear equations:

$$9x_1 + 6x_2 + 4x_3 = 20$$

$$x_1 + 10x_2 + 4x_3 = 6$$

$$2x_1 - x_2 + 10x_3 = -15$$

Now solve them using Gauss Thomas method.

7. Consider the following system of linear equations:

$$9x_1 + 6x_2 + 4x_3 = 20$$

$$x_1 + 10x_2 + 4x_3 = 6$$

$$2x_1 - x_2 + 10x_3 = -15$$

Now solve them using Gauss Siedel method.

[Turn over]

8. Consider the following system of linear equations:

$$x_1 + x_2 + x_3 = 3$$

$$2x_1 + 3x_2 + x_3 = 6$$

$$x_1 - x_2 - x_3 = -3$$

Now solve them using Jacobi method.

9. Write a program to compute the inverse of the following matrix by Gauss elimination method.

$$\begin{bmatrix} 1 & 7 & 2 & 0 \\ 4 & -6 & 0 & -1 \\ 3 & -2 & -2 & 1 \\ 0 & 2 & 9 & 1 \end{bmatrix}$$

10. Consider the following system of linear equations:

$$x_1 + x_2 + x_3 = 3$$

$$2x_1 + 3x_2 + x_3 = 6$$

$$x_1 - x_2 - x_3 = -3$$

Now solve them using Gauss Jordan method.

11. Using Bisection method, find a root of the following equation $x^3 - 4x + 1 = 0$. The result must be correct upto 5 decimal places. Show all the iterations in a tabular form.

12. We will use Romberg integration to obtain a sixth-order accurate approximation to

$$\int_0^1 e^{-x^2} dx$$
