B.E Production Engineering 1st Year 2nd Semester Examination 2019 (old)

Computer Programming and Numerical Analysis

Answer all questions

Time: 3 hours | Full Marks: 100

1. Graphically illustrate Bisection Method. Solve $x^3-5=0$ in [1,2] using Bisection Method for 3 iterations.

Or

Illustrate Fixed Point iteration Method. Apply the said method to solve $x^4-x-10=0$ with 3 iterations.

Or

Illustrate Newton Raphson Method. Apply the said method to solve $x^3-5=0$ in [1,2] with 3 iterations.

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2. Apply Gaussian Elimination to solve the following.

$$x_1+2x_2-x_3=2$$
$$5x_1+2x_2+2x_3=9$$
$$-3x_1+5x_2-x_3=1$$

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3(a) Apply Trapezoidal method to find $\int_0^2 x^3 dx$ taking n=4.

(b) Graphically illustrate Euler's Method for finding solutions to first order differential equations.

7+7

4. Obtain the Lagrange's interpolating polynomial y from the following data.

x	0	1	3	4
y	5	6	50	105

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5(a) Write a C program to read a Celsius temperature value (c) from the keyboard and display the equivalent Fahrenheit value (f) using the following formula.

$$f=1.8c+32$$

(b) Write a C program that will read the lengths of the radii of n circles and display their areas one by one. The value of n is to be read from the key board at the beginning.

5+10

6(a) Write a C program to read a list of n numbers in an array and check if a number x is present in the list. The value of x is to be read as input.

(b) Write a C program to read the following matrix in an array and then display the sum of the numbers in the matrix

$$\begin{bmatrix} 1 & 2 & 5 \\ 2 & 5 & -7 \\ 5 & -7 & 3 \end{bmatrix}$$

10+10

7) Write C program to display the value of the following function $f(x)=2x^2+3x-4$ for a given value of x, which is to be read from the keyboard. A user defined function needs to be used for computing the value of f(x).

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