

Use a separate Answer-Script for each part

PART-I

ANSWER ANY THREE QUESTIONS

Q.NO.5 CARRIES 18 MARKS

Q.1. A) Explain the False position method (with graphical illustration) to find out real root of a non-linear equation.

B) Find out a root of the following equation using Newton Raphson method

$$x^3 + 3x^2 - 3 = 0$$

8+8 16

Q.2. A) Perform four iterations to find out solution set for the following system of equations using the Gauss-Seidel method with the given initial values: $x_1^{(1)} = x_2^{(1)} = x_3^{(1)} = 1$:-

$$4x_1 + 3x_2 + 2x_3 = 17; \quad x_1 + 2x_2 + x_3 = 9; \quad 2x_1 + 3x_2 + 4x_3 = 21$$

B) Explain the Gauss elimination method to solve a set of linear equations.

10+6 16

Q.3.A) Derive the general expression of Newton's forward difference interpolating polynomial.

B) Compute $e^{(-1.3)}$ from the following table using above interpolation method-

x	1	2	3	4	5
y = e ^(-x)	0.3679	0.1353	0.04979	0.01832	0.00674

8+8 16

Q.4. A) Briefly discuss on the Least Square curve fitting method.

B) Find out the expression of the best fit straight line with the following data using Least Square curve fitting method -

x	2	4	6	8	10
y	-3.75	2.15	7.75	14.35	21

8+8 16

Q.5. A) Tabulate the solution of

$$\frac{dy}{dx} = x + y, \quad y(0) = 0 \quad \text{for } 0.1 < x < 0.2 \quad \text{with } h = 0.1 \quad \text{using Euler's method.}$$

B) Compute the value of the following using Trapezoid rule of integration-

$$I = \int_0^{\pi/4} x \cdot \sin(x) dx \quad \text{with four intervals.}$$

9+9 18

[Turn over

**BACHELOR OF ENGINEERING IN
ELECTRICAL ENGINEERING (EVENING) EXAMINATION, 2018 (OLD)
(2nd Year, 2nd Semester, Old Syllabus)
NUMERICAL ANALYSIS AND COMPUTER PROGRAMMING**

Time: Three Hours

Full Marks: 100

(50 marks for each part)

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PART-IIAnswer *any three* questions*Two marks* are reserved for neatness and well organized answer script

1. a) Discuss about `scanf` and `printf` in handling strings. 8
- b) With examples, explain the different types of constants that are used in C. 8
2. a) What do you understand by the term "Operator"? Briefly describe some operators that are used in C programming. 8
- b) What is modulo division operator? With programming example, show how a modulo division operator can be implemented. 8
3. a) Explain branching and looping control in C with suitable examples. 8
- b) Carefully read the following program and explain the step by step execution in your language. What is the output of the program? 8

```
#include <stdio.h>
main()
{
    int n, i;
    unsigned long long factorial = 1;

    printf("Enter an integer: ");
    scanf("%d", &n);
    if (n < 0)

    printf("Error! Factorial of a negative number doesn't
    exist.");
```

P.T.O.

```

else
{
    for(i=1; i<=n; ++i)
    {
        factorial *= i
    }
    printf("Factorial of %d = %llu", n, factorial);
}
}

```

4. a) Explain branching and looping control in C with suitable examples. 8
- b) Explain the execution of the following program and predict the output . 8

```

#include <stdio.h>
main()
{
    double n1, n2, n3;

    printf("Enter three different numbers: ");
    scanf("%lf %lf %lf", &n1, &n2, &n3);

    if( n1>=n2 && n1>=n3 )
        printf("%.2f is the largest number.", n1);

    if( n2>=n1 && n2>=n3 )
        printf("%.2f is the largest number.", n2);

    if( n3>=n1 && n3>=n2 )
        printf("%.2f is the largest number.", n3);

}

```

5. a) Give the differences between C and C++ with suitable example. 6
- b) Write a program in C/C++ that reads a string from keyboard and determines whether the string is palindrome or not. Use only lowercase characters. [A string is palindrome if it reads same when read from forward or backward, e. g. "madam"] 10