B.E. Electrical Engineering (Part Time) EXAMINATION, 2017(OLD)
2ⁿᵈ YEAR 2ⁿᵈ SEMESTER
SUBJECT : NUMERICAL ANALYSIS & COMPUTER PROGRAMMING

Full Marks -100

Time : Three hours   (50 marks for each part)

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 bi-section method (with graphical illustration) to find out real root of a non-linear equation.

B) Find out a root of the following equation in the interval [0,1] -

$$x^3 + x^2 - 1 = 0 \text{ (by False position method)}$$

6+10=16

Q.2. A) Perform four iterations to find out solution set for the following system of equations using the Gauss-Seidal method with the given initial values $x_1^{(1)} = x_2^{(1)} = x_3^{(1)} = 0$:-

$$83x_1 + 11x_2 - 4x_3 = 95; \ 7x_1 + 52x_2 + 13x_3 = 104; \ 3x_1 + 8x_2 + 29x_3 = 71$$

B) Obtain inverse of the matrix 'A' by Gauss-Jordan method $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

10+6=16

Q.3. 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 -

Temp.(^{0}C)	40	50	60	70	80
Length (mm)	600.5	600.6	600.8	600.9	601.0

6+10=16

Q.4. A) Write down the general expression of the Newton's divided difference interpolating polynomial and thus derive the general expression of Newton's forward difference interpolating polynomial.

B) Compute $(4.13)^3$ and $(4.42)^3$ from the following table using suitable interpolation method-

x	4.1	4.2	4.3	4.4	4.5
$y=x^3$	68.921	74.088	79.507	85.184	91.125

6+10=16

Q.5. A) Tabulate the solution of

$$\frac{dy}{dx} = x - y^2, \ y(0) = 0 \quad \text{for } 0.1 <= x <= 0.2 \text{ with } h = 0.1 \text{ using Modified Euler's method.}$$

B) Compute the value of the following using Simpson's 1/3ʳᵈ rule-

$$I = \int_0^1 \frac{dx}{1 + x^2} \text{ with four intervals.}$$

10+8=18

[Turn over

Ex/EE/5/T/223/2017 (OLD)

BACHELOR OF ENGINEERING IN

ELECTRICAL ENGINEERING (EVENING) EXAMINATION, 2017

(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-II

Answer *any three* questions

Two marks are reserved for neatness and well organized answer script

1. a) With example, show the working of break statement.   8

   b) Show how a function can be implemented in programming.   8

2. a) What is modulo division operator? With programming example, show how a modulo division operator can be implemented.   8

   b) What do you understand by the term "Operator"? Briefly describe some operators that are used in C programming.   8

3. a) What are the different types of bitwise operators in C programming? .   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

```c
#include <stdio.h>
main ()
{
   int n[10];
   int i,j;
   for (i = 0; i < 10; i++)
   {
     n[i] = i + 100;
   }
   for (j = 0; j < 10; j++ )
   {
      printf("Element[%d] = %d\n", j, n[j] );
   }
```

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>
int main()
{
    int i = 9876;
    float f = 987.6543;
    printf("%6d\n", i);
    printf("%.2f\n", f);
    printf("%e\n", 987.6543);
    return 0;
}
```

5. a) 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

   b) Discuss about scanf and printf in handling strings. 6

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