Roll No. 24001007034

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December 2024

B.Tech. (First Semester)

Programming for Problem Solving (ESC103)

Time : 3 Hours]　　　　　　　　[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1.　(a)　Draw a flowchart to explain the procedure of compilation.　　　　　　　　1.5

　　(b)　What is virtual memory ? Why is it needed ?　　　　　　　　1.5

　　(c)　What are Strings ? Explain the difference between character arrays and strings.　　1.5

　　(d)　What are header files ?　　　　1.5

　　(e)　What is the difference between cold boot and warm boot ?　　　　1.5

(f) Elaborate a few applications of computers. 1.5

(g) Explain the concept of pointers with the help of an example. 1.5

(h) What do you mean by recursion ? Explain. 1.5

(i) Explain the difference between unary and binary operators. 1.5

(j) How many bytes are required in the memory to store an array int i[20] ? 1.5

Part B

2. (a) What is a flowchart ? Draw a flowchart to find the smallest of three numbers. Also write the Algorithm for the same. 10

   (b) Draw the block diagram of a computer. Also explain the difference between primary memory and secondary memory. 5

3. (a) Write a program using switch-case to find the grade of a student. 5

   (b) Write short notes on the following : 10

   (i) Break and continue

   (ii) Static variables

   (iii) Struct and union.

4. What are array of structures ? Write a program using array of structures to maintain the data of 50 students in a class with their roll no, first name, last name and address. 15

5. (a) Differentiate between do-while and while loops. Use appropriate examples to demonstrate. 5

   (b) Write a program to find the difference between two matrices using functions. 10

6. (a) Write a program to arrange a given array in ascending order using quick sort. What is the time complexity of this program ? 10

   (b) Explain different iterative statements available in C with their syntax. 5

7. What is Recursion ? How is it different from iteration ? Write a program to find the factorial of a number using recursion. 15