

May 2024

B. Tech. (ME/ME(HINDI)/CE/IT/DS/CE(HINDI/
CSE(AIML)) (Second Semester)

Programming for Problem Solving (ESC-103)

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) Define an Algorithm. What are the desirable features of an Algorithm ? 1.5
- (b) Differentiate between Primary Memory and Secondary Memory. 1.5
- (c) What are different types of errors occurred during programming ? 1.5
- (d) What is the difference between Application Software and System Software ? 1.5

- (e) What do you understand by Nesting of If-else ? 1.5
- (f) What is Memory bleeding ? 1.5
- (g) What is the difference between Library functions and User defined functions ? 1.5
- (h) Define a structure. Initialize the member elements of a structure name student with the following values : 1.5
Name-Ramesh, Age-24, Department-CE and Fee is Rs. 34,500.50.
- (i) What do you understand by function prototype ? What is its significance ? 1.5
- (j) Differentiate between the following using small programming examples :
getchar(), gets () and puts(). 1.5

Part B

2. (a) Define Computer System. Explain in detail the functional parts of a computer system with the help of a block diagram. 9
- (b) Draw a flow chart to find out the smallest number out of 3 given numbers. 6

3. (a) Write a program in C to find out the real roots of a quadratic equation. 6
- (b) Write a program in C to print all Armstrong numbers up to 1000. 9
4. (a) Write a program in C to multiply two $N \times N$ matrix. 9
- (b) Define Operating System. What are the various functions performed by OS ? 6
5. (a) Write a program to sort an array by selection sort. 6
- (b) Define a string. How is it stored in memory ? Write a program to that reads a string and counts the number of vowels, words and white spaces present in the string. 9
6. (a) What is a function ? What are different parameter passing techniques ? Explain by taking suitable programming example. 9
- (b) What is a Dangling Pointer ? Write a program that dynamically allocates a structure whose member elements are Student name, Age and Roll No. It reads the various members of the structure and prints them. 6

7. (a) What is the difference between array and structure ? Declare a structure Employee with the following member elements, Emp_name, Emp_date of birth, Emp_dept and Emp_sal. Declare an array of structure, read and print the data of N such employees. 9

(b) Write a recursive function to calculate factorial of a number and call this function in main() to calculate factorial of 5. 6