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**Institute of Technology and Management**  
 (An Autonomous Institution)



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I B.Tech I Sem Regular Examination, December 2019  
**PROGRAMMING FOR PROBLEM SOLVING**  
 (CIVIL, MECH & ECE)

**Time: 3 Hours.**

**Max. Marks: 70**

- Note: 1. This question paper contains two parts A and B.  
 2. Part- A is Compulsory. Answer all Questions which carries 20 marks.  
 3. Part – B consists 5 units. Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART- A**

**(10 x 2 Marks = 20 Marks)**

1. a) If expression is given as  $X = (\text{num} \% n) + 1$  where num and n are integers, what will be the range of values assigned to X? Whether the range depends on n value? 2 M
- b) Do you think machine language program will be faster than the same written in high level language? Give the reason. 2 M
- c) Declare, define and initialize a sample structure. 2 M
- d) Can we copy elements of array A[ ] to array B[ ] by simply B = A; statement? Justify your answer. 2 M
- e) What are the different modes in which a file can be opened? What happens in each mode if file to be opened do not exist? 2 M
- f) Give differences between text and binary files. 2 M
- g) Discuss briefly the limitations of recursive functions. 2 M
- h) What do you mean by signature of a function? 2 M
- i) What is order of complexity of linear search? Justify your answer. 2 M
- j) Show each pass to sort the list 40, 30, 20, 10 using selection sort. 2 M

**PART - B**

**(5 x 10 Marks = 50 Marks)**

2. a) Explain the left shift and right shift operators in C with its usage. 5 M
- b) Give flowchart for calculating distance travelled by formula  $S = ut + \frac{1}{2} at^2$ . Convert the flowchart into program. 5 M

**OR**

3. a) What are similarities between else -if ladder statement and switch statement? When can we use only else-if ladder but not switch statement? 5 M
- b) Write a C program to accept the integer n and prints the numbers from 1 to n except those which are multiple of 5 or 7. 5 M

- 4 a) Write a program to display the location of a character 'J' in a given string. 5 M  
If an array is initialized by statement `int A[ ][4] = {5, 4, 6, 7, 3, 2, 1, 9, 8}`, what is  
b) the element in following variables? i) `A[0][3]` ii) `A[2][0]` iii) `A[2][3]` 5 M  
iv) `A[1][1]` v) `A[0][2]`

**OR**

- 5 a) Discuss about enumerated types in C with suitable example. 5 M  
b) How bit fields can be declared and accessed? Give example. 5 M

- 6 a) What is a file? Discuss the different file I/O functions. 10 M

**OR**

- 7 a) Explain the uses of `#include` and `#define` pre-processor commands. 5 M  
b) Write a program to read a given file and convert the contents of a given file to uppercase equivalent. 5 M

- 8 a) What is function? What are advantages of using functions? Write a program using function that displays addition of all positive numbers and all negative numbers separately. Ex. `n=5, A[ ]={1,2,-2,4,-3}`, Positive sum = 7, Negative sum = -5. 10 M

**OR**

- 9 a) With suitable example, discuss about passing an array to a function. 5 M  
b) Explain the concept of call by value and call by reference. 5 M

- 10 a) Given the list of elements {30, 40, 10, 50, 20}, how many swappings required for bubble sort and selection sort? Which sort is better in above example? 5 M  
b) Write an algorithm for sorting a given list of elements using bubble sort. 5 M

**OR**

- 11 a) Which sorting method is better among bubble sort, selection sort and insertion sort, if the input list given is already in sorted order? Justify your answer. 5 M  
b) Write an algorithm to search an element using binary search. 5 M

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