

**I - B.TECH EXAMINATIONS, DECEMBER - 2010**  
**COMPUTER PROGRAMMING AND DATA STRUCTURES (COMMON TO**  
**CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MECT, E.COMP.E, MMT, MEP, AE,**  
**ICE, BT, AME)**

Time: 3hours

Max.Marks:75

**Answer any FIVE questions**  
**All questions carry equal marks**

---

- 1.a) Explain and specify the interactions between various components that support the basic functionality of a computer?
- b) Discuss in detail the program execution steps? [7+8]
- 2.a) List the basic data types, their sizes and range of values supported by 'C' language?
- b) Describe the purpose of commonly used conversion characters in scanf() function?
- c) Explain the only ternary operator available in 'C' with illustrative example? [6+6+3]
- 3.a) Differentiate between call by value and call by reference with suitable examples?
- b) Write a 'C' program using functions to check whether the given 3x3 matrix is symmetric or not? [8+7]
- 4.a) Explain how strings are declared and initialized in 'C'?
- b) What are the arithmetic operators that are permitted on pointers?
- c) Write a 'C' function to reverse the string passed as an argument that cannot be altered? [4+6+5]
- 5.a) Briefly explain the type definition statement in 'C'? Give any two examples where usage of type definition statement increases the readability of programs?
- b) Write a 'C' program to read, write, add, subtract, multiply and divide two complex numbers? (Represent complex number using structures). [4+11]
- 6.a) What is a file? How to open and close different types of files in 'C'?
- b) Explain the possible modes of opening files? In all these modes what happens when the file doesn't exist and the file already exists?
- c) Write a 'C' program to copy the contents of a file to another file? [4+5+6]
- 7.a) Write a C program for binary search using functions without using recursion?
- b) An array contains 8, 13, 17, 26, 44, 56, 88, and 97. Trace the steps using binary search Algorithm.
  - I. To find value 88
  - II. To find the value 20
  - III. To find the value 8. [9+6]
- 8.a) What is the main disadvantage of Queue over Circular Queue?
- b) Write a 'C' Program to demonstrate the operations of a Circular queue using arrays? [3+12]

**I - B.TECH EXAMINATIONS, DECEMBER - 2010**  
**COMPUTER PROGRAMMING AND DATA STRUCTURES (COMMON TO**  
**CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MECT, E.COMP.E, MMT, MEP, AE,**  
**ICE, BT, AME)**

Time: 3hours

Max.Marks:75

**Answer any FIVE questions**  
**All questions carry equal marks**

- 
- 1 a) Define Algorithm? What are the characteristics that any algorithm should satisfy?  
 b) Draw a flowchart for finding maximum of given three integers?  
 c) Differentiate between compiler and interpreter? [7+4+4]
- 2 a) Differentiate between if-else-if ladder and switch statement?  
 b) What is the implicit type conversion hierarchy that is applied while evaluating expressions?  
 c) List and give examples for different bitwise operators available in 'C'? [4+4+7]
- 3 a) What is the need for user-defined functions?  
 b) What are the different ways in which 1-dimensional arrays can be declared and initialized?  
 c) Write a C program using recursion for finding GCD (Greatest Common Divisor) of two given numbers? [4+3+8]
- 4 a) Explain the syntax with suitable examples the dynamic memory allocation functions available in C?  
 b) Write a C function to find the length of a string passed as an argument? [12+3]
- 5 a) Differentiate between structures and unions?  
 b) What do you mean by bit fields? How bit fields are different from structures?  
 c) Suppose or oppose the statement "In C a structure contains a union inside it". Give suitable example? [5+5+5]
- 6 a) Distinguish between getc() and getchar() functions?  
 b) Explain the general format of fseek() function with illustrative examples?  
 c) Write a C program to append the contents of a file to another file? [4+5+6]
- 7 a) Write a C program for insertion sort using functions?  
 b) An Array contains 47, 3, 66, 32, 56, and 92. After two passes of a sorting algorithm, the array has been rearranged to: 3, 47, 66, 32, 56, and 92. Which sorting algorithm among selection, insertion, and bubble sort is used? Defend your answer? [9+6]
- 8 Write the steps with illustrative figures involved in the following operations of a singly linked list without the head node?  
 I. Insert into an empty List  
 II. Insert at the first position  
 III. Insert at the last position  
 IV. Insert before a given element  
 V. Insert after a given element. [15]

**I - B.TECH EXAMINATIONS, DECEMBER - 2010**  
**COMPUTER PROGRAMMING AND DATA STRUCTURES (COMMON TO**  
**CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MECT, E.COMP.E, MMT, MEP, AE,**  
**ICE, BT, AME)**

**Time: 3hours****Max.Marks:75**

**Answer any FIVE questions**  
**All questions carry equal marks**

- 
- 1 a) Differentiate between application software and system software?  
b) Draw a flowchart for finding the sum of 'n' numbers starting from 1?  
c) Briefly discuss various computing environments with neat diagrams? [2+5+8]
- 2 a) What do you mean by operator precedence and associativity? How one can override the precedence defined by C language? Give illustrative examples?  
b) Explain the structure of a C program? [7+8]
- 3 a) Discuss with suitable examples the storage classes available in C?  
b) Derive the expression for finding the address of any element of a 1-dimensional array? [10+5]
- 4 a) Discuss briefly the following pointers.  
I. Pointer pointing to a variable  
II. Pointer pointing to a constant  
III. Constant pointer pointing to a variable  
IV. Constant pointer pointing to constant.  
b) Write a C program to swap two integers using functions. [10+5]
- 5 a) How many possible ways one can access the members of a structure using a structure variable and a pointer to a structure variable? Illustrate with examples.  
b) Differentiate between Arrays of structures and structures containing arrays with suitable examples? [5+10]
- 6 a) Explain syntax with illustrative examples the functions support reading and writing formatted data to and from files?  
b) Write a C program to count characters and lines in a given file? [7+8]
- 7 a) Write a C program for bubble sort using functions?  
b) An Array contains 3, 13, 7, 26, 44, 23, 98, and 57. Trace the steps using merge sort? [9+6]
- 8 a) Write the steps with illustrative figures involved in the following operations of a singly linked list without the head node?  
I. Delete the first element  
II. Delete the last element  
III. Delete before a given element  
IV. Delete after a given element.  
b) What is a doubly linked list? What is the main advantage over singly linked list? [12+3]

**I - B.TECH EXAMINATIONS, DECEMBER - 2010**  
**COMPUTER PROGRAMMING AND DATA STRUCTURES (COMMON TO**  
**CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MECT, E.COMP.E, MMT, MEP, AE,**  
**ICE, BT, AME)**

**Time: 3hours****Max.Marks:75**

**Answer any FIVE questions**  
**All questions carry equal marks**

- 
- 1 a) List the activities involved in each phase of waterfall system development life cycle model?  
b) What are the different types of errors one can encounter during the program execution? [10+5]
- 2 a) What is an identifier? What are the naming rules for identifiers in C?  
b) List different categories of C operators based on their functionality? Give examples?  
c) Explain different types of coding constants in a C? [3+8+4]
- 3 a) Explain different categories of functions in C with simple illustrative examples?  
b) Write a C program using functions to calculate the factorial of a given number? [10+5]
- 4 a) Demonstrate command-line arguments using a simple program? Explain?  
b) Differentiate between a pointer and a variable? How a pointer is declared and initialized? What do you mean by pointer to another pointer?  
c) Write a C function to convert the string passed as an argument to its uppercase equivalent? [6+4+5]
- 5 a) What is an enumerated type? How it can be declared? What are the different ways one can initialize enumerations?  
b) Differentiate between self referential and nested structures with suitable examples? [7+8]
- 6 a) What is the purpose of the ferror() and feof() functions?  
b) What are the possible ways to set the file pointer to the beginning of the file?  
c) Write a C program to count the number of words in a given file? [4+4+7]
- 7 a) Write a C program for selection sort using functions?  
b) An Array contains 3, 13, 7, 26, 44, 23, 98, and 57. Trace the steps using quick sort? [9+6]
- 8 a) Trace the output string and the stack contents at every step in converting the expression  $A * B / (C - D) + E * F - G$  into postfix expression?  
b) Write a C Program to demonstrate the operations of a Stack using arrays? [6+9]