Code No: R059010104 **Set No. 1**

I B.Tech Supplementary Examinations, Aug/Sep 2006
C' PROGRAMMING & DATA STRUCTURES
(Common to Civil Engineering, Electrical & Electronic Engineering, Electronics & Communication Engineering, Computer Science & Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Information Technology, Electronics & Control Engineering, Computer Science & Systems Engineering, Electronics & Telematics, Electronics & Computer Engineering, Aeronautical Engineering and Instrumentation & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is an expression? What kind of information is represented by an expression?
   (b) What is an operator? Describe several different types of operators that are included with in the C language with an example each. [8+8]

2. (a) Write a program to demonstrate passing an array argument to a function. Consider the problem of finding largest of N numbers defined in an array.
   (b) Write a recursive function power (base, exponent) that when invoked returns base exponent. [8+8]

3. (a) Explain the process of declaring and initializing pointers. Give an example.
   (b) Write a C program that uses a pointer as a function argument. [8+8]

4. Consider a structure master includes the information like name, code, pay, experience. Write a program to delete and display the information contained in master variables for a give code. [16]

5. Write a C program to read a text file and to count
   (a) number of characters,
   (b) number of words and
   (c) number of sentences and write in an output file. [16]

6. Write a program to convert a given postfix expression to prefix expression using stacks. [16]

7. Write a C program to insert and delete the elements from circular doubly linked list. [16]

8. (a) Write and explain non-recursive algorithm for **binary search** with suitable example and discuss the various time complexities of binary search.

(b) Suppose that the list contains the integers 1,2,8 in this order. Trace through the steps of **binary search** to determine what comparisons of keys are done in searching.

i. To locate 3

ii. To locate 4.5 [8+8]

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Code No: R059010104 **Set No. 2**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is the purpose of switch statement? How does this statement differ from the other statements?

   (b) An electric power distribution company charges its domestic consumers as follows:

Consumption Units		Rate of Charge
0-200		Rs. 0.50 per unit
201-400	Rs.100 plus Rs.0.65	per unit excess 200
401-600	Rs.230 plus Rs.0.80	per unit excess of 400.

   Write a C program that reads the customer number and power consumed and prints the amount to be paid by the customer. [8+8]

2. (a) Distinguish between user defined and built-in functions.

   (b) What is meant by function prototype. Give an example function prototype. [8+8]

3. (a) Explain the process of accessing a variable through its pointer. Give an Example.

   (b) Write a C program using pointers to read in an array of integers and print its elements in reverse order. [8+8]

4. (a) Write a C program to illustrate the comparison of structure variables.

   (b) What is the use of a structure? Given an example for a structure with initialized values. [8+8]

5. (a) How does an append mode differs from a write mode.

   (b) Compare between printf and fprint f functions.

   (c) Write a program to copy upto 100 characters from a file to an output array. [4+4+8]

6. Write a C program to evaluate the postfix expression. [16]

7. What is Circular doubly linked list? Explain the various operations on Circular doubly linked lists with suitable algorithms. [4+12]

8. Trace through the steps by hand to sort the following list in **Quick sort**.
   28 7 39 3 63 13 61 17 50 21 [16]

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Code No: R059010104 **Set No. 3**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write a program that calculates the value of money at the end of each year of investment assuming an interest rate of 12 percent and prints the year & corresponding amount in two columns for a period of 10 years with an intial investment of 5 years.
   Formula: Value at end of year = value at start of year (1+interest rate) [16]

2. (a) Distinguish between getchar and scanf functions for reading strings.
   (b) Write a program to count the number of words, lines and characters in a text. [8+8]

3. (a) Write a C program to illustrate the use of structure pointer.
   (b) Explain the effects of the following statements:
      i. int a, *b = &a;
      ii. int p, *p;
      iii. char *s;
      iv. a = (float*)&X; [8+8]

4. (a) What is a structure? How is it declared? How it is initialized?
   (b) Define a structure to represent a data. Use your structures that accept two different dates in the format mmdd of the same year. And do the following: Write a C program to display the month names of both dates. [6+10]

5. (a) Write a C program to read last 'n' characters of the file using appropriate file function.
   (b) Write a C program to read a text file and convert the file contents in capital (upper-case) and write the contents in a output file. [16]

6. Write a C program for implementation of various operations on circular queue. [16]

7. Write a C program to implement a singly linked list with all operations performed on it. [16]

8. (a) Write and explain **linear search** procedure with a suitable example.
   (b) Formulate recursive algorithm for **binary search** with its timing analysis.

[4+12]

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write about space requirements for variables of different data types. [16]

2. (a) Distinguish between getchar and scanf functions for reading strings.
   (b) Write a program to count the number of words, lines and characters in a text. [8+8]

3. (a) Explain the process of declaring and initializing pointers. Give an example.
   (b) Write a C program that uses a pointer as a function argument. [8+8]

4. A company markets Hardware items. Create a structure "hwItem" that stores the title of the item, it's price, an array of three floats so that it can record the sale in rupees of a particular item for the last three months, category of the item and it's original equipment manufacturer. Write a short program that provides facility to read N no. of items information, append new item, and displays all records. [16]

5. (a) Write a C program to read last 'n' characters of the file using appropriate file function.
   (b) Write a C program to read a text file and convert the file contents in capital (upper-case) and write the contents in a output file. [16]

6. Declare a queue of integers. Write functions
   (a) To insert an element in to queue
   (b) To delete an element from queue [8+8]

7. (a) Write and explain the recursive and non recursive procedure for **post order traversal** in a binary tree.
   (b) Draw the binary tree and write the **preorder traversal** by using the following information's
   Postorder traversal = D E C H F G B A
   Inorder traversal = F H B G A D C E [8+8]

8. (a) Write a C program to search for a given element in the integer array using binary search.

   (b) Write a C program to sort the elements of an array using tree sort method with suitable example. [8+8]

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