

I B.Tech Supplementary Examinations, November/December 2005
C & DATA STRUCTURES

(Common to 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 and Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is the purpose of the if-else statement? In what way is this statement different from the while, the do-while and the for statements.
- (b) A cloth showroom has announced the following seasonal discounts on purchase of items:

Purchase amount	Discount	
	Mill items	Handloom items
0-100	-	5%
101-200	5%	7.5%
201-300	7.5%	10.0%
above 300	10.0%	15.0%

Write a C program to read purchase extent and calculate discount. Also print the purchase amount and discount. [8+8]

2. (a) Distinguish between the following:
 - i. Actual and formal arguments.
 - ii. Global and local variables.
 - iii. Automatic and static variables.
- (b) Explain in detail about pass by values and pass by reference. Explain with a sample program [8+8]
3. (a) Distinguish between an array of structures and an array within a structure. Give an example each.
- (b) Write a C program using structure to create a library catalogue with the following fields; Access number, author's name. Title of the book, year of publication, publisher's name, price. [6+10]
4. (a) What is a pointer? How is a pointer initiated? Give an example.
- (b) State whether each of the following statements is true or false. Give reasons.
 - i. An integer can be added to a pointer.
 - ii. A pointer can never be subtracted from another pointer.

- iii. When an array is passed as an argument to a function, a pointer is passed.
 - iv. Pointers can not be used as formal parameters in headers to function definitions.
- (c) If m and n have been declared as integers and p1 and p2 as pointers to integers, then find out the errors, if any, in the following statements.
- i. $p1 = \&m;$
 - ii. $p2 = n;$
 - iii. $m=p2-p1;$
 - iv. $*p1 = \&n;$ [4+6+6]
5. What is a Queue? Explain two applications of it. What are the advantages of a Circular Queue over a linear queue? [4+6+6]
6. Write a routine SPLIT() to split a singly linked list into two lists so that all elements in odd position are in one list and those in even position are in another list. [16]
7. (a) Write an algorithm for prim's minimal spanning tree.
- (b) Write an algorithm that takes as an input the adjacency matrix and returns 1 if the graph is connected and 0 otherwise. [8+8]
8. Explain **heap sort** with example. Write necessary algorithms. [16]
