Duration: 3hrs **[Max Marks:80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required, and state it clearly.

1		Attempt any FOUR	[20]
	a	Explain linear and nonlinear data structures.	
	b	Evaluate the given postfix expression using stack 2 3 4 +∗ 5 ∗	
	c	What are the advantages of a linked list over arrays?	
	d	Explain different graph traversal techniques.	
	e	Given an array int a[]={69,78,63,98,67,70,52,55,96}. Calculate the address of a[6] if the base address of an array is 2100.	
2	a	Write a C program to implement queue using Arrays.	[10]
	b	Given the postorder and inorder traversal of a binary tree, construct the original tree. Postorder: D E F B G L J K H C A Inorder: D B F E A G C L J H,K	[10]
3	a	What is hashing? What properties should a hash function demonstrate?	[10]
	b	Write a program to implement a stack using linked list.	[10]
4	a	Consider the following sorted array DATA with 13 elements: 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99 Illustrate the working of binary search technique while searching an element (i) 40 (ii) 85.	[10]
	b	What is a Binary search tree? Construct a Binary search tree for the following elements. 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18	[10]
5	a	Explain insertion sort using an example. Write an algorithm for it and comment on its complexity	[10]
	b	Write short notes on BFS and DFS algorithms.	[10]

6 a Write a C program to implement a singly linked list. The program should be able to perform the following operations: [10]

1. insert a node in the end
2. delete the last node
3. display the nodes.

b Given the frequency for the following symbols, compute the Huffman code for each symbol. [10]

Symbol	A	B	C	D	E	F
Frequency	9	12	5	45	16	13
