AQ – 2625

First Year Second Semester M. C. A. (CGS) Examination

DATA STRUCTURE AND ALGORITHMS

Paper – 2 MCA 1

P. Pages : 3

Time : Three Hours] [Max. Marks : 80

Note : (1) All questions carry equal marks.
(2) Assume suitable data wherever necessary.
(3) Illustrate your answer necessary with the help of neat sketches.
(4) Use pen of Blue/Black ink/refill only for writing the answer book.

1. (A) What do you mean by right cancellation in string operation ? Explain with suitable example. 6

   (B) Explain how strings are stored in memory with suitable example. 7

OR

2. (A) Explain KMP pattern – matching algorithm with suitable example. 7

   (b) Explain Brute – force pattern matching algorithm with suitable example. 6

3. (A) What do you mean by Bubble Sort of an Array ? 7

   (B) Write a routine to implement a queue using arrays and to enqueue an element into it. 6

OR

4. (A) State and explain Linear search algorithm for an array with suitable example. 7

   (B) Explain Multi – dimensional arrays. 6

5. (A) Write a function to implement sequential search in a linked list. 6

(B) Write a suitable algorithm to perform insertion and deletion operation in a linked list. 8

OR

6. (A) What is a linked list ? Explain with suitable algorithm segments an four operations of a linked list. 8

(B) Illustrate with an example, the linked list reprecentation of graph. 6

7. (A) Explain the Tower of Hanoi problem. 8

(B) What do you mean by Polish notation ? 5

OR

8. (A) Find the prefix and portfix notation of the following infix expression :—

$(a+b-c)*(c/g)-(g-h/i)$ 8

(B) State and explain the Quick sort algorithm with suitable example. 5

9. (A) Built an AVL Tree from the list {5,6,8,3,2,4,7}. 6

(B) What are the basic operation that can be performed on a binary tree ? Explain each of them in detail with suitable example. 8

OR

10. (A) Write an example, explain the algorithm of inorder and port – order traversals on a binary search tree. 8

(B) The order of nodes of a binary tree in preorder and Inorder traversal are as under :—

Inorder Traversal : BCEDFAGH

Preorder Traversal : ABCDEFGH

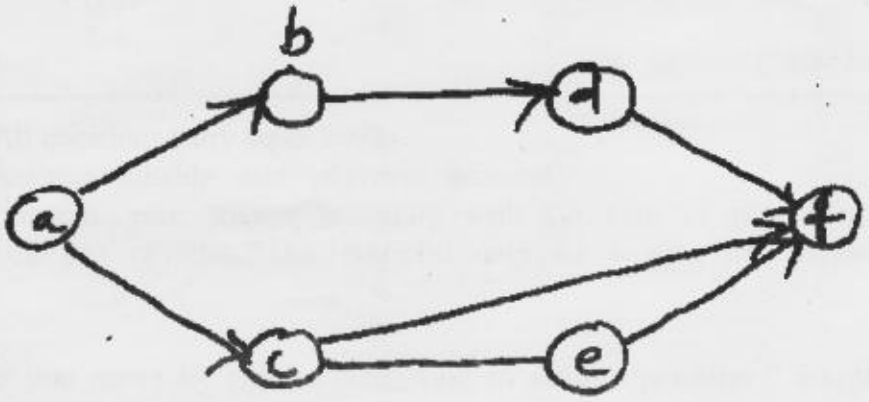
Draw the corresponding Binary tree. 6

11. (A) What do you mean by Hashing ? Explain Dynamic hashing. 7

(B) Explain the Merge sort method. Show how does merging concept work to sort given list of 'n' values. Use suitable example. 8

OR

12. (A) For the following graph show the matrix and list representation of this graph.



7

(B) Define the following terms :—

(a) Acyclic graph

(b) Directed graph

(c) Connected graph. 6