(c) Write an algorithm to do linear search also write complexily. 2+2=4

8. (a) Write an algorithm to do binary search. 4

(b) Sort the following using bubble sort and also show the number of comparison and number of interchange. 4+2=6

10, 15, 17, 20, 25, 30, 16, 70, 6

(c) Sort the following list using quick sort and also write the complexily of quick sort. 4

66, 33, 40, 20, 50, 88, 60, 11

UNIT-V

9. (a) Write short note on following : 3x4=12

(i) File organization

(ii) Hashing

(iii) Open addressing

(b) What is linear probing? 2

10. (a) Define graph? Define biconnecteed graph and directed graph. 3x2=6

(b) Define follow tems : 4x1=4

(i) Path

(ii) Degree of Graph

(iii) Successor

(iv) Leaf Node

(c) Name the different ways of representing a graph and show one of the representation using and example. 4

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UG/PG (CBCS) ODD SEMESTER EXAMINATION, 2022

COMPUTER SCIENCE

3rd Semester

Course No. : MCSC-303

(Data and File Structure)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

(Answer any five questions, taking one from each unit)

UNIT-I

1. (a) What is data structure? Explain various types of data structure in detalil. 2+2=4

(b) Differentiate between row major and coloumn major array index notation. How is address calculated in both. 2+4=6

(c) What do you mean by linked list? Write a function to insert a node in link list. 1+3=4

2. (a) When doubly linked list can be represented as circular linked list? 3

(b) What are the metirs and demeirts of array implementation of list? 3

(c) Write advantages and disadvantahes of array over linked list. 4

(d) Explain the operations of singly linked list. 4

UNIT-II

3. (a) Define stuck. 2

(b) Write functions for each of the following :

(i) PUSH (ii) POP (item) (iii) TOP (stuck) 2x3=6

(c) What are the applications of stuck? 2

(d) Distinguish between stuck and queue. 2

(e) Define overflow and underflow. 2

4. (a) Define circular queue. 2

(b) Write a function to delete an element from the queue. 3

(c) How do you check for an empty queue. 2

(d) Convert infix (a+b) & (c+d)/f into postfix and predix expression. 2

(e) Write an algorithm to insert element in a queue. 3

(f) Write applications of queue. 2

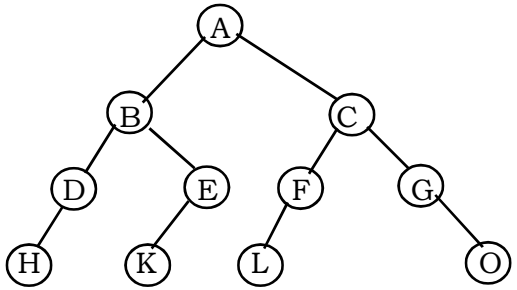
UNIT-III

5. (a) What is a binary tree? Write the maximum number of nodes possible in a binary tree of depthe d. Explain the following term with respect to a binary tree. 2+1+3=6

(i) Complete binary tree

(ii) 2-tree

(b) Find the Inorder, Preorder and Postorder Traversal of given binary tree. 6



(c) Make a binary search tree using following data. 2

45, 56, 78, 23, 11, 54, 88, 43

6. (a) Given the following in order and preorder traversal reconstruct a binary tree.

Inorder : DBEAFC 3+1=4

Preorder : ABDECF

Also find the post order traversal.

(b) Define AVL tree? What is a balance factor in AVL tree? what do you mean by traversing and also write applications of a binary tree. 2+1+1+2=6

(c) Write short note on B-tree and also describe the RR and RL rotation of AVL tree. 2+2=4

UNIT-IV

7. (a) Define sorting? Write an alogorithm of bubble sort. 2+4=6

(b) Write an algorithm to do insertion sort. 4