

Time: 02:00 P.M. to 05:00 P.M.

Total Marks: 70

Q.1 Multiple Choice Questions.

10

1. An array is a \_\_\_\_\_ data structure.  
A. Heterogeneous  
B. Non-Linear  
C. Unordered  
D. Homogeneous
2. In any binary tree, maximum number of nodes on level  $l$  is \_\_\_\_\_, where  $l \geq 0$ .  
A.  $2^{(l+1)}$   
B.  $1^2$   
C.  $2^{(l-1)}$   
D.  $2^l$
3. If the range of index varies from  $L$ .....  $U$  then size of the array is\_\_\_\_\_.  
A.  $U - L + 1$   
B.  $L - U + 1$   
C.  $U / L - 1$   
D.  $L / U - 1$
4. A digraph is known as \_\_\_\_\_ graph.  
A. Directed graph  
B. Multiple graph  
C. Double graph  
D. Undirected graph
5. \_\_\_\_\_ is a rank of hierarchy of a tree.  
A. Degree  
B. Level  
C. Height  
D. Index
6. A directed edge is known as \_\_\_\_\_.  
A. Segment  
B. Double edge  
C. Arc  
D. Arrow
7. Record is also known as group or \_\_\_\_\_.  
A. Item  
B. Entity  
C. Segment  
D. None of these
8. K-way merging is known as \_\_\_\_\_.  
A. Simple merge  
B. Selection sort  
C. Multiple merging  
D. Binary merging
9. A \_\_\_\_\_ which defines a mapping from key space to the address space.  
A. Deblocking  
B. Blocking  
C. Hashing Function  
D. None of these
10. In selection sort algorithm, for  $i^{\text{th}}$  pass of the sort, \_\_\_\_\_ comparisons are required.  
A.  $n + i$   
B.  $n - i$   
C.  $n + 1$   
D.  $n - 1$

( P.T.O )

- Q.2 Answer the following questions in short. (Any 10) 20
- 1) Define tree with an example.
  - 2) Define File organization and list out different types of file organization.
  - 3) Write down the syntax and purpose of open statement for Input mode.
  - 4) What is sparse matrix?
  - 5) Define merge sort.
  - 6) What are the types for representing Binary tree?
  - 7) List the applications of Searching.
  - 8) Define : Node and Branch
  - 9) Draw a full Binary Tree with at least 6 nodes.
  - 10) Define isolated vertex and null Graph.
  - 11) Explain in brief prime area.
  - 12) Define sorting. Also list the sorting techniques.

- Q.3 Explain address calculation of 2-D array element with example. 10

OR

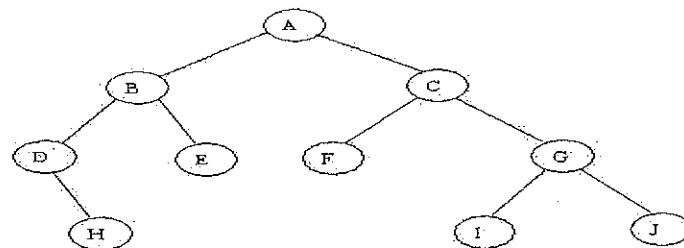
- Q.3 Define array. Explain 1-D array with declaration, initialization and address calculation with example. 10

- Q.4(A) What are the types of traversal of Binary tree? Explain any two with an example. 06

- (B) Define the following with an example. 04  
a. Loop      b. Cycle

OR

- (A) Traverse the given tree using Inorder, Preorder and Postorder traversals. 06



- (B) Define the following with an example. 04  
a. Sink Node      b. Source Node

- Q.5(A) Difference between Searching and sorting. 06

- (B) Define the all step of merge sort of following data? 04

List-1 9, 15, 23, 34, 45

List-2 12, 27, 32

OR

- (A) Write down the algorithm of bubble sort. 06

- (B) Write down the algorithm of sequential search. 04

- Q.6(A) Explain the structure of index sequential file supported by IBM. 06

- (B) Write a short note on Multiple buffering. 04

OR

- (A) Write a detail note on structure of Direct files. 06

- (B) Write a short note on Single buffering. 04

\*\*\*\*\*