SARDAR PATEL UNIVERSITY
BCA(SEMESTER-III) EXAMINATION November-2019
November 22, 2019, Friday
02:00 p.m. to 05:00 p.m.
USO3CBCA03 (Advanced Data and File Structures)

Marks: 70

Q. 1 **Multiple Choice Questions** [10]

1 An array is a _____ data structure.
  a. Composite. b. Unordered. c. Non-composite. d. Heterogeneous.

2 The number of elements in an array is called the _____ of the array.
  a. Size. b. Type. c. Base d. Index.

3 Tree is a _____ data structure.
  a. Linear b. Variable. c. Non-linear. d. Non-subscript.

4 A binary tree has at most _____ child.
  a. Two. b. One c. Three. d. None of these.

5 In an order pair (Vi, Vj) of diagraph is in the set of edges E indicates that an edge directed from _____
  a. Vi to Vi. b. Vj to Vj. c. Vi to Vj. d. Vj to Vi.

6 A directed edge is known as _____.
  a. Segment b. Arc. c. Double edge d. Arrow.

7 _____ is the operation of arranging the records of a table into some sequential order according to an ordering criterion.
  a. Searching b. Sorting c. Inserting. d. Updating.

8 If n denotes the sum of the sizes of the two sub tables to be merged, then the timing performance of merge sort algorithm is _____
  a. $O(n)$ b. $O(n^2)$ c. $O(n^3)$ d. None of these

9 A _____ is a collection of information items about a particular entity.
  a. Record b. Entity c. Database d. None of these

10 The collection of files is known as _____
  a. Data file b. Database c. File d. None of these

Q. 2 **Short Question (Any TEN)** [20]

1 Write the formula for address calculation of 1-D array element and explain it.
2 Define Child node and siblings of a tree.
3 Suppose that each element requires 2 word (byte), the base address of the array a[10] is 250 and lower bound of the array is 0. Find the address of a[4].
4 Explain weighted and multi Graph.
5 Draw the Binary Tree for (A-B)+c*(E/F)
6 Define Directed and Undirected Graph.
7 Define searching. Also list the searching techniques.
8 Define merge sort.
9 Difference between Searching and sorting.
10 Write down the syntax and purpose of open statement for Input mode.
11 Define: Key, Sequence Key
12 Write down the advantages of index sequential file.

Q. 3

[A] Explain the representation of 1-D array in the memory. [5]

[B] Assume that the base address of the two dimensional array a[10][10] is 300, each element requires 2 byte (word). Find the address of the element a[4][3] using Row-major order and Column-major order. [5]

OR

Q. 3

[A] Explain declaration and initialization of 2D array. [5]
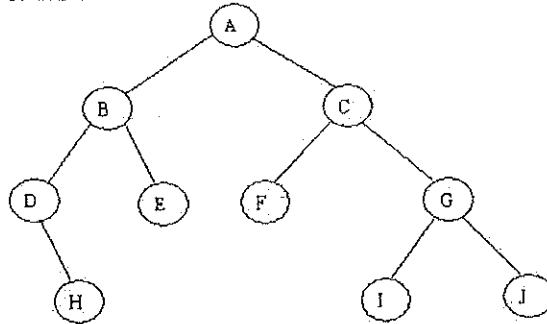
[B] Explain Sparse Matrix in detail. [5]

(P.T.O)

Q. 4

[A] 1. Define the following with an example. **[5]**
        a. Loop
        b. Cycle
        c. Sink Node
        d. Source Node
        e. Undirected graph

[B] Draw the binary tree for following expressions: **[5]**

In order	n1	n2	n3	n4	n5	n6	n7	n8	n9
Postorder	n1	n3	n5	n4	n2	n8	n7	n9	n6

OR

[A] Traverse the given tree using Inorder, Preorder and Postorder traversals. **[5]**

Given tree:

[B] Explain the insertion of a node in a binary with an example. **[5]**

Q. 5

[A] Define the all step of bubble sort as an ascending order of following data: **[5]**
        55, 22, 77, 92, 12

[B] Write down the algorithm of Sequential search. **[5]**

OR

[A] Write down the algorithm of bubble sort. **[5]**

[B] Define the all step of selection sort as an ascending order of following data? **[5]**
        15, 23, 17, 9, 20, 28, 25

Q. 6 Write a detail note on structure of Direct files. **[10]**

OR

Q. 6 Explain in detail the structure of Sequential File **[10]**

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