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SARDAR PATEL UNIVERSITY

B.C.A.(3rd SEM) – EXAMINATION NOVEMBER–2022

US03CBCA52 : DATA STRUCTURES - I

Date: 12-11-2022(SATURDAY) **Time:02:00 PM to 05:00 PM**

NOTE: Right hand figure indicates the marks of each question. **Marks: [70]**

Q. 1 Multiple Choice Questions (One marks each) **[10]**

1 Index of an array is always an _____ value.

(A) String (B) Integer

(C) Float (D) Stack

2 _____ operation finds the presence of data items in the list of data items.

(A) Sorting (B) Updating

(C) Merging (D) Searching

3 _____ are the building blocks of program.

(A) Information (B) Data Structure

(C) Data (D) Data Types

4 A stack is _____ type of data structure.

(A) Linear (B) Non-Linear

(C) Both (A) and (B) (D) None of these

5 An operation that is used to insert an element on a stack is known as _____.

(A) Push (B) Pop

(C) Peep (D) Change

6 Prefix notation is also called_____.

(A) suffix notation (B) reverse polish

(C) polish notation (D) Both A & B

7 A Queue is a _____ Data Structure.

(A) Non-Primitive (B) Linear

(C) homogeneous (D) All of these

8 For a circular queue, if the queue contains 3 items then Front and Rear will be

(A) 0,2 (B) 0,3

(C) 1,3 (D) 1,4

9 A_____ is a collection of information items about a particular entity,

(A) Record (B) Database

(C) Entity (D) None of these

10 A node whose indegree is 0 is called _____.

(A) Source node (B) Self loop

(C) Single node (D) Cycle

Q. 2 Short Questions. (Attempt any ten) **[20]**

1 Define Array with suitable example.

2 Define the term Data Structure.

3 List out advantages of Data Structure.

4 Explain in brief array representation of a Stack.

5 Give postfix form for A * B + C

6 List operations carried out on a Stack. Define any one of them.

7 State the limitations of Simple Queue.

8 What are Ascending Priority Queues? Explain.

9 Define queue. List the types of Queues.

10 Explain Serial processing in brief.

11 What do you mean by Transaction? Which types of transactions are performed on the file?

12 Write down the syntax and purpose of Open statement for Input mode.

Q. 3 **A]** List out operations used on Data Structure. Explain any three. **[06]**

B] Explain address calculation of 2-D array element with example. **[04]**

OR

Q. 3 **A]** Explain in brief Classification of Data Structure. **[06]**

B] Explain 1-D array with declaration and initialization. **[04]**

Q. 4 **A]** Write an algorithm for Peep operation of a Stack. **[05]**

B] Define stack. And also explain notations in detail. **[05]**

OR

Q. 4 **A]** Write an algorithm to insert an element into a Stack. **[05]**

B] Give postfix form for A + [(B + C) + (D + E) * F] / G. **[05]**

Q. 5 **A]** Write an algorithm to Insert an element in a Circular queue. **[05]**

B] Explain the Priority Queues with example. **[05]**

OR

Q. 5 **A]** Explain the Simple Queues with an example & explain the limitations of Simple Queues. **[05]**

B] Write an algorithm to Delete an element from a Simple queue. **[05]**

Q. 6 **A]** Explain in detail the structure of Sequential File. **[05]**

B] Define the terms: (1) Cycle, (2) complete Graph, (3) Sink node, (4) Degree of vertex, (5) Connected graph. **[05]**

OR

Q. 6 **A]** Write a short note on Multiple buffering. **[05]**

B] Define the terms: (1) Record, (2) Graph, (3) Diagraph, (4) Directed edge, (5) Weighted Graph. **[05]**