SEAT No._____ **Sardar Patel University**

[5/A-10] **External Theory Examination- Sept-2022**

F.Y.B.C.A (2ᵗʰ Semester, Under CBCS) – Old Course

US02CBCA01 || Advance C Programming and Introduction to data structure

Date: 24-9-2022

Time: 9:30 am to 11:30 am   **Total Marks: 70**

                                                                                                            [10]

Q.1   **Answer the following questions.**

1. Which of the following defines a pointer variable to an integer?
   - A.   int &ptr;
   - B.   int *ptr;
   - C.   int **ptr;
   - D.   int &&ptr;

2. Which of the following is not a C memory allocation function?
   - A.   malloc()
   - B.   realloc()
   - C.   calloc()
   - D.   alloc()

3. Which of the following can be used to create a new type that can be used anywhere a type is permitted?
   - A.   typedef
   - B.   array
   - C.   struct
   - D.   Both struct and typedef

4. Given a structure variable named stu which is of type struct STU and contains a field named major, which of the following statements correctly refers to major?
   - A.   major
   - B.   stu-major
   - C.   stu.major
   - D.   STU.major

5. Which one of the following is valid for opening a file for only reading?
   - A.   fileOpen (filenm, "r");
   - B.   fileOpen (filenm, "ra");
   - C.   fopen (filenm, "r");
   - D.   fopen (filenm, "read");

6. Files are a _____type of Data Structure.
   - A.   Linear
   - B.   Primitive
   - C.   Non-Primitive
   - D.   Non-Linear

7. A data structure in which insertion and deletion of an elements occurs at only one end is known as _____.
   - A.   Queue
   - B.   Stack
   - C.   Tree
   - D.   Graph

8. An operation that is used to change the value of an element at a particular position from a top of a stack is known as _____.
   - A.   Push
   - B.   Pop
   - C.   Peep
   - D.   Change

9. A data structure that contains not only a data field but also contains pointer field is known as _____.
   - A.   Queue
   - B.   Stack
   - C.   Tree
   - D.   Linked List

10 Which of the following is TRUE for a Queue data structure?
   - A.   Linear
   - B.   Non-primitive
   - C.   Both (A) and (B)
   - D.   None of the Above

Q.2   **Fill in the blanks and True/False.**   **[08]**

1   _____operator is used with a pointer to access the value of the variable whose address is contained in the pointer

2   _____allows a portion of memory to be shared by different types of data

3   An operation that is used to insert an element on a stack is known as ____

4   A linked list in which last node pointing to the first node is known as _____ linked list.

5   **alloc() is a C memory allocation function. [True/False]**

6   We can access the members of a structure using # operator. **[True/False]**

7   Array data structure store the homogeneous data elements. **[True/False]**

8   A storage representation of a linked list in a memory is Non- Linear. **[True/False]**

Q.3   **Explain following in brief. (Attempt any Ten)**   [20]

1   Explain realloc function.
2   List out benefits of pointers.
3   List different pointer declaration style. Which one is preferable?
4   Differentiate: structure and union
5   Write syntax of structure within structure.
6   Define: member operator
7   List file modes available to manage the file in C.
8   Which are the main operations that can be performed on Data Structure?
9   List out different applications of data Structure.
10   State various types of queue.
11   State various Applications of Linked List.
12   What is a doubly Linked list?

Q.4   **Explain following in detail (Attempt any four)**   [32]

1   Define: Pointer. How is it declared? Also explain how arithmetic operations
     can be performed on the pointer variable by taking example.
2   What is Dynamic memory allocation? Explain malloc() and realloc() function
     with syntax and example.
3   What is structure? Explain its declaration and assigning values to members of
     structure.
4   Explain array of structures and array within structure using suitable examples
5   Write an algorithm to insert an element and delete from a stack,.
6   Explain fprintf(), fscanf(), fopen() function with syntax and example.
7   Write an algorithm to insert an element at the beginning of a Singly linked list.
8   Write an algorithm to insert and delete an element from a simple queue.

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