[A-57 & A-58]   **SARDAR PATEL UNIVERSITY**
BCA EXAMINATION, 2nd SEMESTER (2010-batch)
Monday, 9th April, 2018
2:00 p.m. to 5:00 p.m.
US02CBCA01
[Advanced C Programming and Introduction to Data Structure]

Maximum Marks: 70

Q-1   Multiple Choice Question.[Each Question carries one Mark]   [10]

1) Which operator is used with a pointer to access the value of the variable whose address is contained in the pointer?
   - A. Address (&)
   - B. Assignment (=)
   - C. Indirection (*)
   - D. Selection (->)

2) Which of the following defines and initializes a pointer to the address of x?
   - A. int *ptr = *x;
   - B. int &ptr = *x;
   - C. int *ptr = &x;
   - D. int *ptr = ^x;

3) Which of the following allows a portion of memory to be shared by different types of data?
   - A. Array
   - B. Structure
   - C. Union
   - D. File

4) Which of the following is not a derived data type?
   - A. Arrays
   - B. Float
   - C. Pointers
   - D. Structure

5) What are two predefined FILE pointers in C?
   - A. stdout and stderr
   - B. console and error
   - C. stdout and stdio
   - D. stdio and stderr

6) Which of the following data structures are indexed structures?
   - A. linear arrays
   - B. linked lists
   - C. Both A and B
   - D. None of these

7) A data structure where elements can be added or removed at either end but not in the middle?
   - A. Linked lists
   - B. Stacks
   - C. Queues
   - D. Deque

8) A linked list is _____ type of data structure?
   - A. Linear
   - B. Non-Linear
   - C. Both (A) and (B)
   - D. None of the Above

9) Which of the following is NOT an application of a Stack data structure?
   - A. Stack Machine
   - B. Recursion
   - C. Evaluation of an Expressions
   - D. Creates a folder

10) A linked list in which last node pointing to the first node is known as _____.
   - A. Singly linked list
   - B. Doubly linked list
   - C. Circular linked list
   - D. None of the above

[PTO]

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Q-2   Give Answers for the following:(Any SIX)   [12]

     1   Differentiate malloc() and calloc().

     2   List out operations that can be performed on pointers.

     3   Differentiate: structure and union.

     4   Explain typedef in brief with suitable example.

     5   Differentiate: printf and fprintf.

     6   List out different applications of data Structure.

     7   What is a Linked List? How is it represented?

     8   Define : Circular Queue and Priority Queue.

Q-3   A)   Define pointer variable. How can we declare and initialize pointer variable? How can we   [5]
            access value of variable through pointer type variable?

       B)   Write a note on Dynamic memory allocation.   [3]

<div align="center">OR</div>

Q-3   A)   Explain pointer arithmetic with example.   [5]

       B)   Write note on: pointer to pointer   [3]

Q-4   A)   What is structure? Explain its definition, declaration and assigning values to members of   [5]
            structure.

       B)   Explain array within structure using suitable example.   [3]

<div align="center">OR</div>

Q-4   A)   What is union? Explain its storage representation. How a member of union is assigned an   [5]
            initial value? Explain in brief with example.

       B)   Explain array of structures using suitable examples.   [3]

Q-5   A)   Describe the usage and limitation of function **getc** and **putc** with example.   [5]

       B)   Explain the **getw** and **putw** function with example.   [3]

<div align="center">OR</div>

Q-5   A)   Explain the all the modes of file management with example.   [5]

       B)   Explain **fprintf** and **fscanf** function with example.   [3]

Q-6   A)   Write a short note on primitive data structure operations.   [5]

       B)   Write a short note on linear data structure.   [3]

<div align="center">OR</div>

Q-6   A)   Write a short note on non linear data structure.   [5]

       B)   Write down advantages of data structure.   [3]

Q-7   A)   Write an algorithm to **insert** an element at the **beginning** of a Singly linked list.   [4]

       B)   Write an algorithm to **delete** an element from a Singly linked list.   [4]

<div align="center">OR</div>

Q-7   A)   Write an algorithm to **insert** an element at the **ending** of a Singly linked list.   [4]

       B)   Write an algorithm to **insert** an element into a Singly linked list that maintains **ascending**   [4]
            order of elements.

Q-8   A)   Explain a QUEUE with an example. Write along with for various operations performed   [5]
            over a queue.

       B)   Write an algorithm to insert an element into a Stack.   [3]

<div align="center">OR</div>

Q-8   A)   Explain a STACK with an example. Write along with for various operations performed over   [5]
            a stack.

       B)   Write an algorithm to delete an element from a simple queue.   [3]

<div align="center">——X——</div>