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Sardar Patel University  
External Examination (CBCS)

M. Sc.(Integrated) II<sup>nd</sup> Semester (Information Technology)  
PS02CIIT03

Advanced C Programming and Introduction to Data Structures  
7<sup>th</sup> April, Thursday - 2016

Time : 10:30 am to 01:30 pm

Total Marks :70

**Q.1 Select an appropriate option.**

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1. Which of the following is not a derived data type?  
(a) Arrays                      (b) Float                      (c) Pointers                      (d) Structure
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 allows a portion of memory to be shared by different types of data?  
(a) Array                      (b) Structure                      (c) Union                      (d) File
4. What are two predefined FILE pointers in C?  
(a) stdout and stderr                      (b) console and error  
(c) stdout and stdio                      (d) stdio and stderr
5. Which one of the following is valid for opening a file for only reading?  
(a) fopen (filem, "r");                      (b) fopen (filem, "ra");  
(c) fopen (filem, "r");                      (d) fopen (filem, "read");
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. Which of the following data structure store the homogeneous data elements?  
(a) Arrays                      (b) Records                      (c) Pointers                      (d) None of these
8. The term "push" and "pop" is related to the \_\_\_\_\_.  
(a) array                      (b) queue                      (c) stacks                      (d) all of above
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. A data structure in which insertion and deletion of an elements occurs at both the end is known as \_\_\_\_\_.  
(a) stack                      (b) queue                      (c) priority queue                      (d) deque

**Q.2 Answer the following questions. (Attempt any TEN)**

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1. Differentiate between '\*' and '&' operators in pointers.
2. List out benefits of pointers.
3. What is scale factor? Explain with example in brief.
4. Explain typedef in brief with suitable example.

5. List file modes available to manage the file in C.
6. Explain function(s) used to read the integer number from the file.
7. Give representation of a Stack data structure.
8. List operations that can be performed on Data structure.
9. What is non-primitive Data Structure?
10. What is a doubly linked list?
11. State various types of queue.
12. Differentiate between stack and queue data structure.

- Q.3** [a] Write a note on Dynamic memory allocation. **5**  
 [b] Explain pointer arithmetic with example. **5**

**OR**

- Q.3** [a] Explain array of structures using suitable examples. **5**  
 [b] Explain pointer to structure using appropriate example. **5**

- Q.4** [a] What is union? Explain its definition, declaration and assigning values to members of union. **5**  
 [b] Describe the usage and limitation of function getc() and putc(). **5**

**OR**

- Q.4** [a] Explain fprintf() and fscanf() function with example. **5**  
 [b] Explain storage representation of union. How members of union are assigned an initial value? Explain with example. **5**

- Q.5** Explain STACK with an example. Write algorithm to perform various operations on a stack. **10**

**OR**

- Q.5** [a] Write a short note on primitive data structure operations. **5**  
 [b] What is data structure? Write down advantages of data structure. **5**

- Q.6** [a] Write an algorithm to delete an element from a Singly linked list. **5**  
 [b] Write an algorithm to insert an element into a simple queue. **5**

**OR**

- Q.6** [a] Write an algorithm to insert an element at the end of a singly linked list. **5**  
 [b] Write an algorithm to delete an element from a simple queue. **5**

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