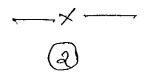[85]

# SARDAR PATEL UNIVERSITY
## Master of Computer Applications (MCA)
### Semester – II ATKT External Examination
### PS02CMCA03 (Data Structures and Advanced Programming Concepts)
### 29th October 2018, Monday

Time: 10:00 a.m. to 1:00 p.m.

Max Marks: 70

[8]

**Q-1 Choose the most appropriate option for each question:**

1. A data structure in which insertion and deletion of an element occurs at only one end is known as _____

    A. Array
    B. Stack
    C. Tree
    D. All of these

2. Which is better computing time (in analysis of algorithm)?

    A. $O(N)$
    B. $O(N^2)$
    C. $O(logN)$
    D. $O(N^3)$

3. Array is

    A. Linear data structure
    B. Non-linear data structure
    C. Complex data structure
    D. None of these

4. If the MAX_SIZE is the size of the array used in the implementation of circular queue. How is rear manipulated while inserting an element in the queue?

    A. rear=(rear%1)+MAX_SIZE
    B. rear=rear%(MAX_SIZE+1)
    C. rear=rear+(1%MAX_SIZE)
    D. rear=(rear+1)%MAX_SIZE

5. The _____ members of a class have strict access control.

    A. Private
    B. Public
    C. Protected
    D. None of these

6. The wrapping up of data and functions into a single unit(class) is known as _____

    A. Inheritance
    B. Polymorphism
    C. Encapsulation
    D. Abstraction

7. The string function _____ concatenates two strings resulting in a single string.

    A. strcat()
    B. strcon()
    C. strconcat()
    D. None of these

8. Member functions defined inside a class are considered as _____ functions by default.

    A. Default
    B. Main
    C. Inline
    D. None of these

( P.T. O.)

## Q-2 Answer the following questions (Any Seven): [14]
1. Explain linear data structure
2. What is doubly link list?
3. List out Stack operations and explain any one.
4. Explain fields and records.
5. Define the following: 1) Polymorphism   2) Inheritance
6. What is a virtual function?
7. Differentiate between dynamic memory allocation and static memory allocation.
8. List different types of inheritance.
9. Explain Public and Protected Access Control Specifiers.

## Q-3 Answer the following questions:
A. Write a note on time and space efficiency of algorithms.
B. Briefly explain Binary Trees and its representations. [6]
[6]

**OR**

B. Explain the Circular Queue. Also write algorithms for delete and display operations [6] performed on Circular Queue.

## Q-4 Answer the following questions:
A. What is Stack? Explain application of stack and write an algorithm of any one operation of [6] stack.
B. Write a note on B Tree.
[6]

**OR**

B. What is hashing? Explain hashing techniques.
[6]

## Q-5 Answer the following questions:
A. List the features of Object Oriented Programming.
B. Explain the concept of multipath inheritance with code snippet. [6]
[6]

**OR**

B. Discuss I/O stream objects available in C++.
[6]

## Q-6 Answer the following questions:
A. Explain Unary Operator Overloading with friend function concept with code snippet. [6]
B. What is a copy constructor? Explain its use with C++ Program. [6]

**OR**

B. Discuss the concept of virtual destructors with code snippet.
[6]