UNIT – IV

8. (a) Define queue. Explain the various operations on queue using linked representation with the help of algorithm and diagram. 8

(b) What is postfix notation ? State the relevance of postfix notation. Transform the given infix expression into postfix expression and also write the various steps involved in conversion : 8

$$((A + B)/D)\uparrow((E - F)*G)$$

9. (a) What is linked list ? Explain different types of linked list available in data structure. Explain the procedure of inserting and deleting a node from doubly linked list with example. 10

(b) Distinguish between stack and queue and also write various application of stack. 6

Roll No. .....

67002-N

MCA (Bridge Course) (MCA 2 Year Programme) w.e.f. 2020-21 Examination – July, 2022

C++ AND DATA STRUCTURES

Paper : 20BCC11C2

Time : Three hours] *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Units. Question No. 1 is *compulsory*. All questions carry equal marks.

COMPULSORY QUESTION

1. (i) Define the term overflow and underflow. $2 \times 8 = 16$

(ii) What do you mean by collision and why it occurs ?

(iii) Enlist the various applications of queue data structure.

(iv) How new operator is better than malloc function ?

P. T. O.

(v) Illustrate the concept of dynamic initialization with suitable example.

(vi) Explain the concept of reference variables with suitable example.

(vii) Define arrays. Write down the various notations that are used to represent the array.

(viii) What do you mean by pure virtual functions ?

UNIT – I

2. (a) What is class ? What are the various ways to define the member function of the class ? Explain the concept of static data members and static member functions with suitable example. 8

(b) Explain the concept of friend function and its need. Illustrate the use of friend function with the help of an example. 8

3. Distinguish between the following : $2 \times 8 = 16$

(a) Procedural and Object Oriented Programming

(b) Classes and Structures

UNIT – II

4. (a) How code reusability can be achieved using inheritance ? Demonstrate the various types of derivations and types of inheritance with suitable diagram. 10

(b) What is function overloading ? Write a program to overload an area function to calculate the area of circle, rectangle and triangle. 6

5. (a) What is an exception ? Explain the concept of multiple catch and re-throwing an exception using a suitable example. 10

(b) Differentiate between virtual class and virtual function. Enlist the various rules for implementing the virtual functions. 6

UNIT – III

6. What is quick sort ? Write down the algorithm for quick sort and also explain the significance of pivot element in quick sort. Explain the complexity of the quick sort algorithm and solve the following problem using quick sort using suitable diagrams 9, 7, 5, 11, 12, 2, 14, 3, 10, 6. 16

7. (a) Explain the term algorithm. What are the various properties of algorithm ? Explain the different techniques to design the algorithm. 10

(b) Explain the concept of data structures. Enlist the various types of data structure available for the programmer. 6