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Unit-IV

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8. (a) Explain the various notations which are used to represent the arithmetic expressions. Write the

algorithm for the evaluation of a postfix expression

and evaluate the given postfix expression :

12, 7, 3, -, / 2, 1, 5, +, *, +

8

(b) Define the term queue. Explain the insertion operations on queue using array, represent with the help of algorithm and diagrams. 8

9. Briefly explain the term linked list. What are the advantages of linked representation over array representation ? How traversal and insertion is performed into a sorted linked list, explain using algorithm and diagram. 16

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MCA Bridge Course (MCA 2 Year Programme)
W.e.f. 2020-21 Examination, December-2022
C++ AND DATA STRUCTURES

Paper-20BCC11C2

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt five questions in all. Question No. 1 is compulsory. In addition to compulsory question, attempt four more questions, selecting one question from each unit. All questions carry equal marks.

1. Compulsory Question :

8×2

- (i) Define the concept of abstract class.
- (ii) What is inline function ?
- (iii) Illustrate the various application of stack data structure.
- (iv) Write the various designing techniques for algorithms.
- (v) What is garbage collection ? Why it is used ?
- (vi) Which data structure is used to reverse any given string ?
- (vii) What do you mean by data structure ?
- (viii) What is the significance of "new" operator in C++?

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Unit-I

2. (a) Explain the various characteristics of object oriented programming language. 8
(b) What are the various methods to pass an argument to a function ? Write a code snippet to swap the values of two variables using function. 8
3. (a) What do you mean by constructor ? Illustrate the various types of constructors using suitable example. 8
(b) Enlist the various control statements available in C++ programming with their syntax and suitable example. 8

Unit-II

4. (a) What is runtime polymorphism ? How runtime polymorphism is achieved in C++ ? Explain with the help of suitable example. 10
(b) Distinguish between overloading and overriding 6
5. (a) Define the term exception and its types. Explain the exception handling mechanism with the help of throw and catch block using a suitable example. 8

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- (b) Explain the following with suitable example 2×4
 - (i) Abstract Class
 - (b) Pure Virtual Function

Unit-III

6. (a) Explain the term hashing and its usage. Also, explain the concept of collision in hashing and the various collision resolution techniques. 8
(b) What do you mean by multidimensional arrays ? What are the various methods to store the multidimensional arrays in the memory ? Consider a 2-D array S of order $[25 \times 4]$. The base address of the array is 300, words per memory cell is 4. Find the address of $S[13,9]$ and $[9,2]$ using various ordering. 8
7. Explain the term sorting. Write down the algorithm for selection sort. Also, explain the complexity of the selection sort algorithm. Solve the following problem using selection sort using suitable diagram.
26, 54, 93, 17, 77, 31, 44, 55, 20 16

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P.T.O.