



K20P 0551

Reg. No. :

Name :

**II Semester M.C.A. Degree (CBSS-Reg./Suppl./Imp.) Examination, May 2020
(2014 Admission Onwards)**

MCA2C08 : DATA STRUCTURES AND ALGORITHMS USING C++

Time : 3 Hours

Max. Marks : 80

SECTION - A

Answer **any ten** questions. **Each** question carries **three** marks. **(10×3=30)**

1. What are the difference between call by reference and call by value with respect to memory allocation ?
2. How polymorphism is implemented in C++ ?
3. List out the advantages and disadvantages of a linked list over array.
4. Compare and contrast constructors and destructors.
5. How memory is allocated to a class and its objects ?
6. What is Stack ADT ? List out applications of stack.
7. What is circular linked list ?
8. What is recursion ? Explain with example.
9. Give infix and postfix notations with example.
10. Differentiate between single linked list and double linked list.
11. State the algorithmic technique used in merge sort.
12. What is meant by minimum cost spanning tree ?

P.T.O.



SECTION - B

Answer **all** questions. **Each** question carries **ten** marks. (5×10=50)

13. a) i) What are the advantages of using default arguments ? Explain with example program. 5
ii) Write a program to implement nested classes using C++. 5
OR
- b) i) What are the difference between pointers to constants and constant to pointers ? 5
ii) Explain with the basic concepts of object oriented programming. 5
14. a) Explain the various types of inheritance with suitable example program. 10
OR
- b) What are the virtual functions ? Explain their needs using a suitable example. What are the rules associated with virtual functions ? 10
15. a) What is a stack ? Write down the procedure for implementation various back operations. 10
OR
- b) i) Write a routine to insert an element in a linked list. 5
ii) What is a queue ? Write an algorithm to implement a queue. 5
16. a) What are AVL tree ? Explain all its rotations with suitable example. 10
OR
- b) Explain briefly about create add/delete node operations in binary search tree. 10
17. a) Write routines to find shortest path using Dijkstra's algorithm. 10
OR
- b) What are the various searching techniques ? Discuss their merits and demerits in brief. 10
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