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**Question Paper Code : 80438**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Third Semester

Electronics and Communication Engineering

EC 2202/EC 33/10144 EC 303/080290009 — DATA STRUCTURES AND OBJECT  
ORIENTED PROGRAMMING IN C ++

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Highlight the advantages of static data member and static function in C++.
2. Mention the operators that cannot be overloaded.
3. What is the need to declare base classes as virtual?
4. What is the use of virtual functions in C++?
5. What is an DEQUE?
6. Write any two advantages of binary heap.
7. Consider a B-tree how to find the minimum key stored in the tree also write the time taken in terms of number of disk accesses.
8. Differentiate between trees and graphs.
9. What is K-way merge?
10. Write the template for depth-first search.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the concept of passing array of objects as an argument” with an example. (8)
- (ii) Write a program to evaluate the equation,  $A = B * C$  using classes and objects where A, B and C are objects of the same class. (8)

Or

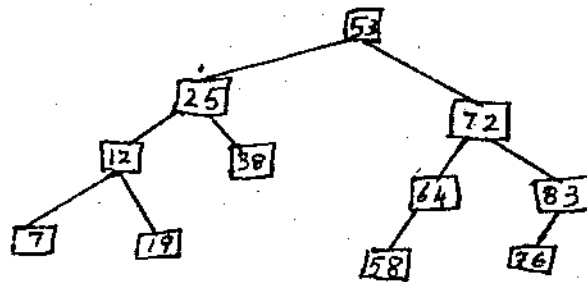
- (b) (i) Illustrate the working of constructors and destructors with an example. (8)
- (ii) Explain the characteristics of object oriented programming in detail. (8)
12. (a) (i) What is inheritance? Explain with examples the different types of inheritance in C++. (12)
- (ii) What are the different modes in which you can open a file in C++? (4)

Or

- (b) (i) Explain how to overload template function with an example. (8)
- (ii) Explain how to handle multiple exceptions in C++ with an example. (8)
13. (a) (i) Explain the operations performed on QUEUE in detail. Write a C++ program to implement these QUEUE operations. (10)
- (ii) Write a program for insertion of a node in a binary heap. (6)

Or

- (b) (i) Write a program to implement STACK through linked list. (8)
- (ii) Explain the function of open-addressing and chaining in collision resolution. (8)
14. (a) Draw the result of inserting 20, 10 and 24 one by one into the AVL tree given below. Draw the tree after each insertion. Explain the operations of the AVL tree. (16)



Or

- (b) (i) Explain spanning tree and minimal spanning tree with examples. (8)
- (ii) Explain the Network flow problems and their solutions. (8)

15. (a) For which sorting divide and conquer technique is used. Write its algorithm with explanation to sort 10 values.

Or

- (b) Give short notes of:
- (i) Merge sort with suitable example. (8)
  - (ii) Quick sort with suitable example. (8)

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