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## Question Paper Code: 40951

## B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Third/Fourth Semester

**Electronics and Communication Engineering** 

EC 6301 – OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

(Common to : Biomedical Engineering/Medical Electronics/Robotics and Automation Engineering)

(Regulations 2013)

Time: Three Hours

Maximum: 100 Marks

Answer ALL questions

PART – A

 $(10\times2=20 \text{ Marks})$ 

- 1. List the access specifiers in C++.
- 2. Outline the role of the unary operators new and delete in C++.
- 3. Define an abstract class and a concrete class.
- 4. Present the syntax for class declaration in C++.
- 5. Define an abstract data type.
- 6. What is a nonlinear data structure? Give examples.
- 7. Define a binary tree. Give example.
- 8. Outline an undirected graph with an example.
- 9. State the difference between merge sort and quick sort.
- 10. How linear search algorithm works?



## PART - B

 $(5\times13=65 \text{ Marks})$ 

11. a) What is a constructor? Outline with an example default constructor, parameterized constructor and copy constructor. (13)

(OR)

- b) i) Write a C++ program to print the prime numbers from 2 to n. (6)
  - ii) What is a friend function? Explain with an example. (7)
- 12. a) Define inheritance. Outline with an example public inheritance, protected inheritance and private inheritance. (13)

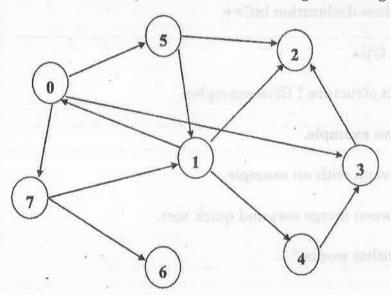
(OR)

- b) When should pure virtual functions be used in C++? Present an example of when pure virtual functions are necessary and map the example you have presented to a C++ program. (13)
- 13. a) Outline a queue data structure with a diagram and explain the algorithm for inserting data into a queue and deleting data from a queue. (13)

(OR)

- b) Explain with an example the algorithm for evaluating a postfix expression using stack data structure. (13)
- 14. a) Explain with an algorithm and an example preorder, inorder and postorder traversal on a binary tree. (13)

b) Outline the breadth first traversal algorithm for a graph and apply the breadth first traversal algorithm to the following directed graph:



Start with node 5 and illustrate the traversal process step by step.

15. a) Explain the merge sort algorithm with an example.

(13)

(OR)

b) Outline the steps to perform binary search on a sorted array of 'N' numbers with an example. (13)

PART - C

(1×15=15 Marks)

16. a) Write a C++ program to sort an array of 'n' numbers in ascending order. (15)
(OR)

b) Write a C++ program to multiply two matrices. Use classes and member functions. (15)

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