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**Question Paper Code : 40951**

05/05/18

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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

(10×2=20 Marks)

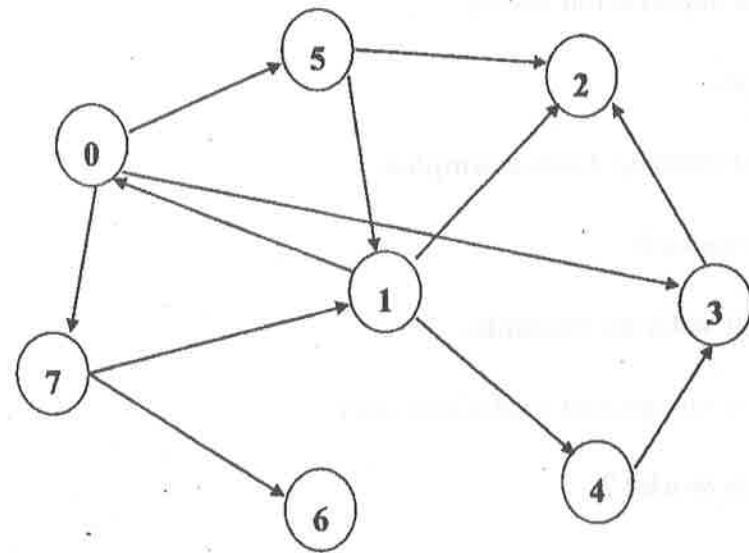
1. List the access specifiers in C++.
2. Outline the role of the unary operators new and delete in C++.
3. Define an abstract class and a concrete class.
4. Present the syntax for class declaration in C++.
5. Define an abstract data type.
6. What is a nonlinear data structure ? Give examples.
7. Define 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

(5×13=65 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)  
(OR)
- 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. (13)



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)