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**Question Paper Code : 91441**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019  
Third/Fourth Semester

Electronics and Communication Engineering  
EC6301 – 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. Define a friend function.
2. What is a proxy class ?
3. Define a pointer. Give example.
4. What is dynamic binding ?
5. How an element is added to a queue and removed from a queue ?
6. Convert the infix expression  $A + B - C$  to prefix expression.
7. Represent the expression  $A + (B - C)/D$  as a binary tree.
8. What is an undirected graph ? Give example.
9. How merge sort algorithm works ?
10. Outline the difference between linear search and binary search.

PART – B

(5×13=65 Marks)

11. a) What is a function ? Explain function overloading with C++ code snippets. (13)

(OR)



- b) i) Write a C++ program to print the first 'n' prime numbers. (5)  
ii) Write a C++ program to perform computation of sin (x) as given below : (8)

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} \dots \dots \dots N \text{ terms}$$

12. a) Explain public, protected and private inheritance with C++ code snippets. (13)  
(OR)

- b) i) Explain an abstract class and a concrete class with C++ code snippets. (7)  
ii) When to use virtual destructors ? Explain with C++ code snippets. (6)

13. a) What is a list ADT ? Explain array implementation and linked list implementation of a list ADT with an example and relevant diagrams. (13)  
(OR)

- b) What is a stack ADT ? Explain the operations that can be performed on a stack ADT with an example and relevant diagrams. (13)

14. a) Illustrate the algorithm to perform preorder, inorder and postorder traversal on a binary tree with an example. (13)  
(OR)

- b) Illustrate the steps in the depth first search graph traversal algorithm with an example. (13)

15. a) Explain the steps in the quick sort algorithm with an example. (13)  
(OR)

- b) Explain the steps in the linear search and binary search algorithm with an example. (13)

PART – C

(1×15=15 Marks)

16. a) Write a C++ program to accept two matrices, multiply them and display the result. Use classes and member functions. (15)  
(OR)

- b) Write a C++ program to sort an array of 'N' numbers using merge sort. Use classes and member functions. (15)