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Question Paper Code : X 20439

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Third/Fourth Semester
Electronics and Communication Engineering
EC 6301 – OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES
(Common to Biomedical Engineering/Medical Electronics Engineering/Robotics
and Automation Engineering)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is a friend function ? Give example.
2. Outline the use of destructors.
3. Define overriding.
4. What is dynamic binding ?
5. Give examples for linear and non-linear data structures.
6. What is an abstract data type ?
7. Define a general tree. Give example.
8. What is a directed graph ?
9. Write a note on divide and conquer strategy.
10. Outline the difference between linear search and binary search.



PART – B

(5×13=65 Marks)

11. a) i) Write a C++ program to perform computation of $\cos(x)$ as given below : (8)

$$\cos x = x - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} \dots N \text{ terms}$$

- ii) Write a C++ program to print the first 'N' prime numbers. (5)

(OR)

- b) i) Write a note on dynamic memory allocation. (5)

- ii) Explain function overloading with C++ code snippets. (8)

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

(OR)

- b) i) Explain the use of constructors and destructors in derived classes with C++ code snippets. (8)

- ii) Explain a virtual function with C++ code snippets. (5)

13. a) Explain the operations that can be performed on a Stack ADT with an algorithm, example and relevant diagrams. (13)

(OR)

- b) Explain the operations that can be performed on a List ADT with an algorithm, example and relevant diagrams. (13)

14. a) What is a binary tree ? Explain preorder, inorder and postorder traversal on a binary tree with an algorithm and an example. (13)

(OR)

- b) Explain graph traversal using depth first search with an algorithm, example and relevant diagrams. (13)

15. a) Explain the insertion sort algorithm with an example. (13)

(OR)

- b) Explain the binary search algorithm with an example. (13)

PART – C

(1×15=15 Marks)

16. a) Write a C++ program to implement a Queue ADT. (15)

(OR)

- b) Sort the following numbers using quick sort :

333, 99, 15, 12, 6, 17, 3, 19, 23, 22, 32, 44, 55, 77, 66, 11, 111, 222

Illustrate each step of the sorting process.

(15)