**Reg. No. :** | | | | | | | | | | |

**Question Paper Code: 41035**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Fourth Semester

Electrical and Electronics Engineering

(Common to Electronics and Instrumentation Engineering and

Instrumentation and Control Engineering)

01UIT424 - DATA STRUCTURES AND ALGORITHMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. List the characteristics of Constructor
2. Define template
3. What are objects and how they are created?
4. What is inheritance? State the different types.
5. Define ADT.
6. Mention any two applications of Stack.
7. Define connected components of a graph. Write its uses.
8. Explain the applications of priority queues.
9. What do you mean by greedy algorithms?
10. Name two sorting algorithm that does not uses divide and conquer strategy.

PART - B (5 x 16 = 80 Marks)

11. (a) Explain overloading concept with unary and binary operators with examples. (16)

Or

(b) How would you overload functions and develope a program for finding volume of different shapes using Function Overloading. (16)

12. (a) Explain the different methods of Exception handling in C++. (16)

Or

(b) Develop a C++ program for Library Management system using the concept of Hybrid Inheritance. (16)

13. (a) (i) Write the insertion and deletion operation in singly linked list. (6)

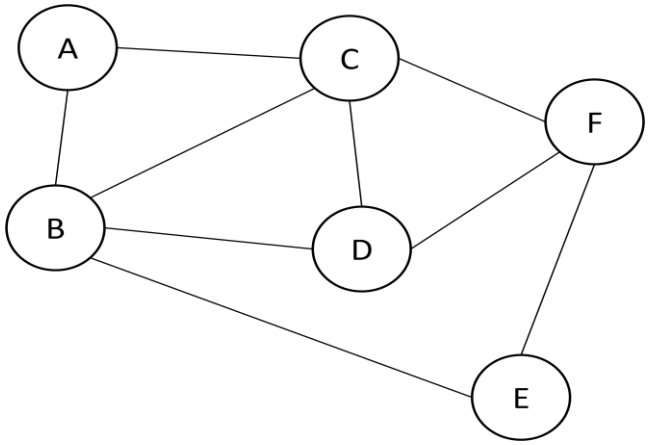
(ii) Explain stack ADT and convert the given Infix expression to Postfix Expression using stack. A+ (B*C-(D/E^F)*E)*H. (10)

Or

(b) (i) Write the insertion and deletion operation in doubly linked list. (10)

(ii) Write a function to insert an element into circular singly linked list. (6)

14. (a) (i) Justify the necessity for graph traversal. Perform the Depth first and Breadth first traversals to print the list of nodes in the order it is visited and compare these algorithms. (8)



(ii) Construct the minimum spanning tree using Prim's algorithm for the above graph. (8)

Or

(b) (i) Write the routine to insert an element into an AVL tree and show the result of inserting the following keys 3, 1, 4, 5, 9, 2, 6, 8, 7, 10. (8)

(ii) Construct a Binary tree for the given expression and perform all the traversals. Expression: a*(b + c) / d – e. (8)

15. (a) Design an algorithm which works based on partition strategy. Illustrate the sorting process by using the following set of numbers 13, 81, 92, 43, 31, 65, 87, 26, and 75. (16)

Or

(b) Compare merge sort and insertion sort algorithms with examples. (16)

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