

**322413(22)**

**B. E. (Fourth Semester) Examination,  
Nov.-Dec. 2015**

**(Old Scheme)**

**(CSE, IT Branch)**

**DATA STRUCTURES**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Attempt all questions. Q. No. 1 is compulsory.  
Attempt any two questions from 2, 3 and 4  
which are of 7 marks.***

**Unit-I**

- 1. Describe big 'O' notation used in algorithm.**
- 2. Write an algorithm to insert new node at the beginning, at the middle position and at the end of a single linked list.**

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**PTO**

3. Write the C++ program to print elements with count more than  $n/k$ .
4. Write an algorithm to reverse the digits of a decimal number.

### Unit-II

1. State the advantages of dynamic data structure.
2. Discuss about basic operation that can be performed on a singly linked list.
3. Write down the steps required for splitting of a given singly linked list in two singly linked list. Also write the algorithm for splitting one singly linked list in two singly linked list.
4. Define doubly linked list. Also write an algorithm to traverse the doubly linked list.

### Unit-III

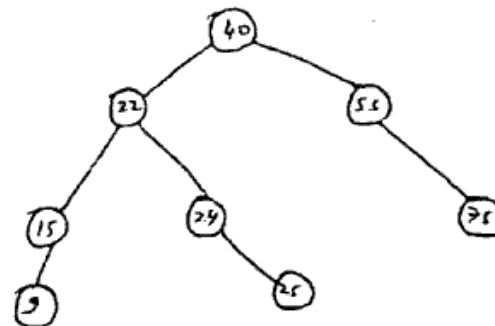
1. What are the two operations on stack?
2. Write a program in C to create an empty stack and to push an element into it.

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3. Write an algorithm to evaluate a post fix expression and explain it with example.
4. What are the limitations of linear search and how can it be resolved using binary search.

### Unit-IV

1. Define binary search tree.
2. Make a binary search tree of values 80, 40, 150, 100 and 30 with proper illustrations.
3. Define AVL tree. Also perform delete operation on node 75 from the given AVL tree, and find the balanced AVL search tree after RO rotation.



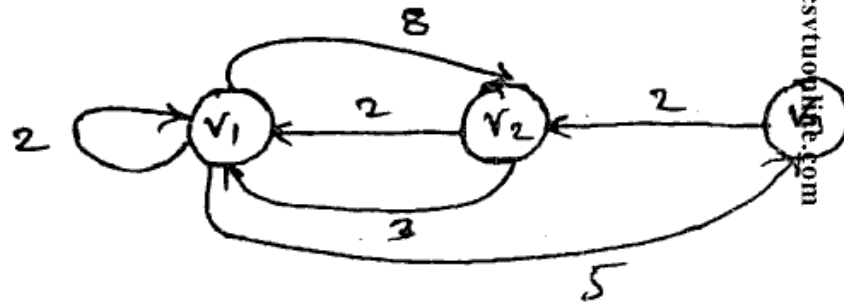
4. Define B tree of order m. Also insert the following entries into an initially empty B-tree of order 5.

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a, g, f, b, k, c, h, n, j, d, r, i, s, x, e, l, m, t, u, v.

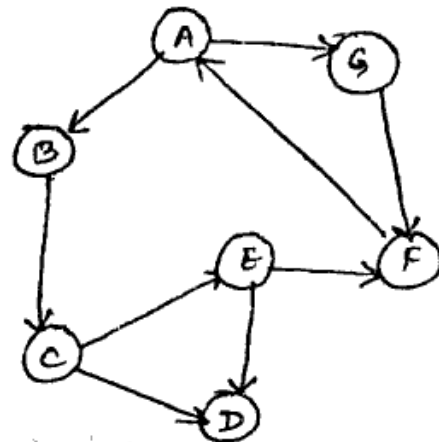
Unit-V

1. Define DAG with an example.
2. Explain Warshall algorithm consider the following diagram.



Compute transitive closure at the adjacency matrix representation of it.

3. Consider the graph shown in figure (a) use DFS to traverse it. Clearly state each step.



4. Discuss about Prim's algorithm. Given the weighted graph in fig. (b). Find the MST using Prim's algorithm.

