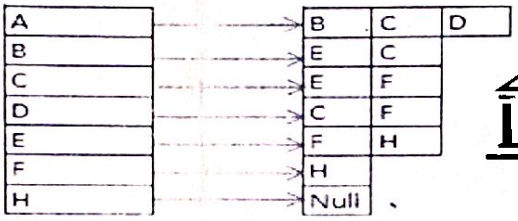
JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA
T-3 EXAMINATION
B.TECH (II SEMESTER) - CSE/IT/ECE/BT/DUAL COURSES

COURSE CODE: 10B11CI211 DURATION: 120 MIN
COURSE NAME: DATA STRUCTURES MM: 35

Note: All questions carry equal marks.

1. Consider the following representation of an unweighted undirected graph using adjacency list. Consider A as starting node, generate the BFS and DFS traversal of this graph using Stack and Queue, wherever required. Show all the intermediate steps.



2. Consider the adjacency representation of a directed graph, write pseudo code/ algorithm or code in C to find the nodes having maximum in-degree and out-degree.

3. Determine what the following code does for a BST.

```
struct binNode
{  int val;  struct binNode * LC,*RC; }*ptr;
struct binNode *FC( struct binNode * ptr)
{  struct binNode * SP;   SP = ptr ->RC;
 while( SP->LC != NULL)
 SP = SP->LC;
  return SP;        }
```


4. Consider char A[10] and char B[10] are given, which are the pre-order and in-order traversal of a binary tree. Write a recursive function which takes these two arrays as input and generates the corresponding binary tree.
Apply your algorithm to create the tree if pre-order array is: A, B, E, L, C, F, G, H
& in-order is B, E, L, A, C, F, H, G.

5. The student data has to be stored in a hash table of size 12. Using the division method, insert the following enrolment number in the hash table :
20, 12, 55, 22, 14, 35, 40, 52. For division method use h(k)=k mod (11)
Use linear probing for the collision resolution. Also find the enrolment number 22.

6. Arrange the following numbers in ascending order using heap sort. Show all the intermediate steps of tree formation and deletion of root.
3,13,2,67,23,11,12,45,22

2 3 11 12 13 22 23 45 67

7. Apply binary search and interpolation search on the following input to search 56 and compare the performance of both the approaches.
1,3,4,21,25,28,32,45,43,53,55,56,78,80.