

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER- II • EXAMINATION – SUMMER 2015**

**Subject Code: 620001**

**Date: 28/05/2015**

**Subject Name: Data Structure**

**Time: 10:30 am - 01:00 pm**

**Total Marks: 70**

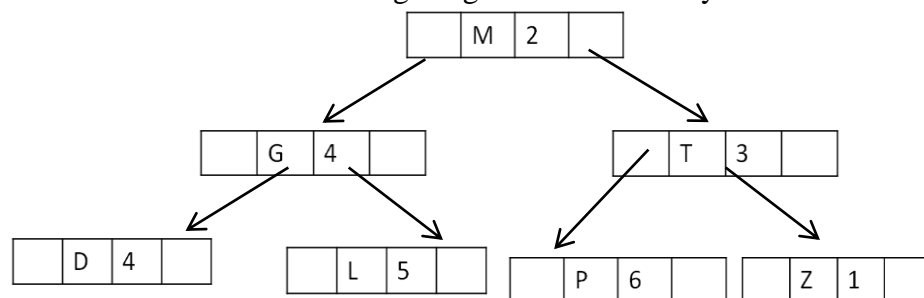
**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (a) Do As Directed :**

**07**

1. Define : best case, average case and worst case complexity.
2. Draw node structure of three variables polynomial.
3. What is the ALOS of following weight balanced binary tree?



4. List out types of hash functions.
5. Define : cutvertex
6. How can you identify the matrix is sparse matrix or not?
7. Define : ordered tree

**(b) Give Difference (Write only main difference) :**

**07**

1. Stack V/S Queue
2. Varying length string V/S Variable length string
3. Full binary tree V/S Complete binary tree
4. Primitive DS V/S Non – Primitive DS
5. Selection Sort V/S Bubble sort
6. Singly linked list V/S Doubly linked list
7. Time complexity V/S Space complexity

**Q.2 (a) Convert following expression into postfix using stack table.**

**07**

$A + B * C - D / E ^ F + G$

**(b) 1. Explain KWIC indexing with e.g.**

**04**

2. Give difference between linear search and binary search.

**03**

**OR**

**(b) 1. Draw and write steps to move 3 discs using Tower of Hanoi problem.**

**03**

2. Write an algorithm to delete an element from circular queue.

**04**

**Q.3 (a) Write algorithms using circular singly linked list.**

**07**

1. Insert after specific node

2. Delete last

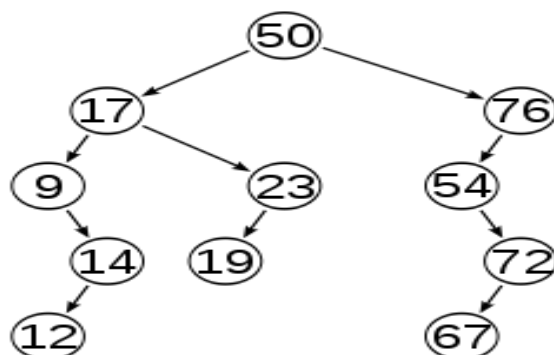
**(b) Arrange following elements using Heap sort.**

**07**

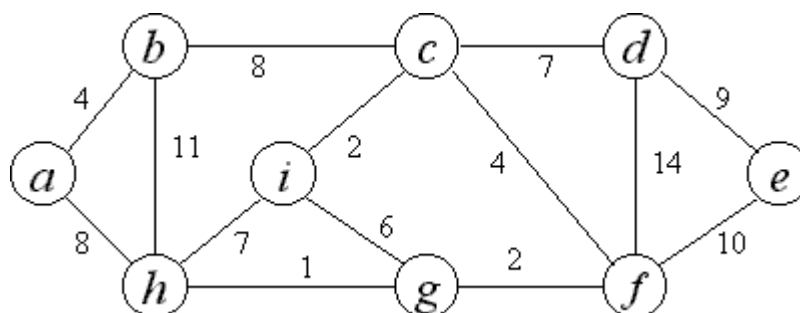
97, 47, 75, 82, 36, 45, 12, 55, 7, 92

**OR**

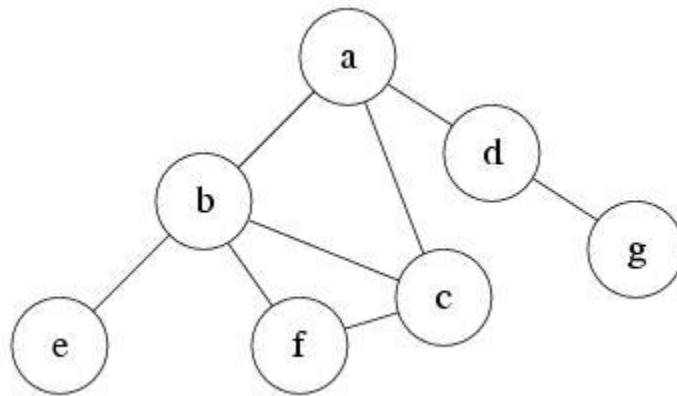
- Q.3 (a)** Write algorithms using doubly linked list. **07**  
 1. Insert before specific node  
 2. Delete first
- (b)** 1. Write algorithm of quick sort. **03**  
 2. Arrange following elements using radix sort. **04**  
 97, 47, 75, 82, 36, 45, 12, 55, 7, 92
- Q.4 (a)** 1. What is Head node in threaded binary tree? Convert following binary tree into threaded binary tree. **05**



2. Write short note on garbage collection. **02**
- (b)** Find Postorder : **07**  
 Preorder : A B D G C E H I F  
 Inorder : D G B A H E I C F
- OR**
- Q.4 (a)** 1. Write short note on trie structure. **03**  
 2. Draw 2 – 3 tree using following elements. **04**  
 50 , 25 , 75, 22, 40, 60, 80, 90, 15, 30
- (b)** What is collision? Explain collision resolution techniques with e.g. **07**
- Q.5 (a)** Draw AVL tree using following elements : **07**  
 3, 2, 1, 4, 5, 6, 7
- (b)** What is minimal spanning tree? Find out MST of following graph using Prim's Algorithm. **07**

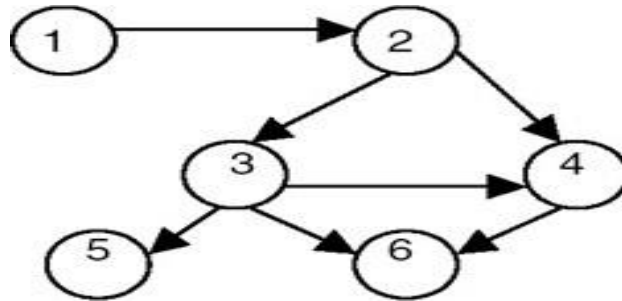


- OR**
- Q.5 (a)** Give difference between DFS and BFS using following e.g. **07**



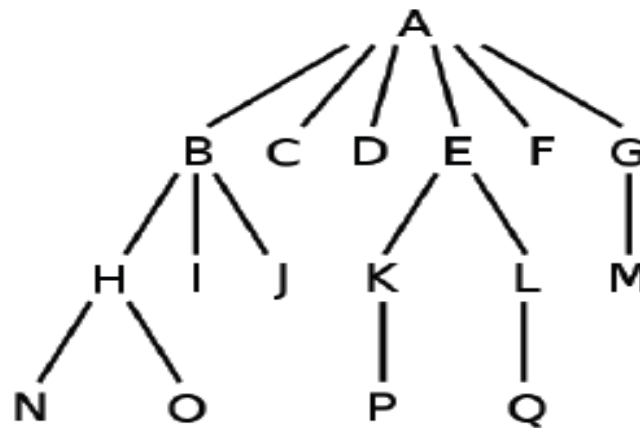
- (b) 1. Explain topological sorting using following e.g.

04



2. Convert following general tree into binary tree.

03



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