



**KINGS**  
COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2008-2009 / ODD SEMESTER

**QUESTION BANK**

**SUBJECT CODE : CS1201**

**SEM / YEAR : III / II**

**SUBJECT NAME : DATA STRUCTURES**

**UNIT – 1**

**PROBLEM SOLVING**

**PART-A(2Marks)**

1. Define Top-down design strategy.
2. Define ADT.
3. Define Worst case and Average case Complexities of an algorithm
4. When we say an algorithm is so efficient. Give the time complexity notation.
5. Write some powerful computational strategies which are used in Computing.
6. How we construct loop statement.
7. Define Linear and Non Linear data structures.
8. Define Debugging and Testing.
9. Give suggestions to improve the efficiency of an algorithm.
10. Write the formal statements for Input and Output assertion.

**PART-B**

1. Write major steps involved in the Program verification **(16)**
2. a. Write are the various aspects for Problem solving? **(8)**  
b. Computational task for Program execution **(8)**
3. How we implement the algorithms? Discuss it briefly. **(16)**
4. Write a short note for Analysis of Algorithm? With each notation and case efficiency. **(16)**

5. a. How we perform Matrix Multiplication with order of n. (8)
- b. Write an ADT program to reverse the order of digits. (8)
6. Discuss about Top Down design approach and primitive/Non primitive Data structures. (16)

## UNIT - 2

### LISTS – STACKS AND QUEUES

#### PART-A (2Marks)

1. What is meant by Linked List?
2. Advantages doubly over singly linked list?
3. Write sample code for construct node.
4. What is meant by Pointer?
5. Why we use pointer variable on Linked list?
6. What is dequeue?
7. What are the various operations performed by Linked list.
8. Define Stack.
9. What is a Radix sort?
10. What is meant by Circular queue and its advantages?
11. What do you mean by cursor implementation of list?
12. What are the exceptional conditions for stack?

#### PART-B

1. Write a C program for the array implementation to insert a new element in the anywhere. (16)
2. Discuss briefly about array and linked list implementation for stack. (16)
3. a. Write an ADT program for stack and Queue. (8)
- b. Write an algorithm for Radix sort and also checking for balanced parenthesis. (8)
4. Draw the circular queue. Give pseudo code for perform insert and delete operations. (16)
5. What are the various operations performed by singly linked list. (16)

**UNIT – 3****TREES****PART-A (2Marks)**

1. What is meant by Complete Binary tree?
2. Explain Tree traversal?
3. Define the following terminologies in a tree, such as siblings and height.
4. Give the linked list representation of tree with an example.
5. What circumstances we are used Priority queue.
6. Distinguish between Binary tree and Binary search tree.
7. What is an AVL Tree?
8. What is meant by Hashing and collision?
9. Any two rules for Binary heap.
10. What is meant by Internal and external searching?

**PART-B**

1. Write a routine to generate tree to solve different traversal techniques with example. (16)
2. Write the function to insert, find and delete an element from a binary search tree. (16)
3. How we check if the AVL tree is balanced or Imbalanced. (16)
4. a. What are the various methods involved to solve hashing function? (8)  
b. Narrate some application areas used by Hashing techniques. (8)
5. Discuss Binary searching techniques for iterative and recursive function calls. (16)

**UNIT- 4****SORTING****PART-A (2 Marks)**

1. What is meant by internal and external sorting?
2. How we classify the sorting algorithms.
3. For large n values, which sorting technique is used most?

4. Write the analysis of shell sort.
5. Write two advantages of Quick sort.
6. In which sorting technique we use Divide and conquer method.
7. What are the limitations of insertion sort?
8. Which is the best way of choosing the pivot element in quick sort?
9. Merge sort is better than insertion sort. Why?
10. Define Heap sort.

**PART-B**

1. What is meant by Insertion sort explain with algorithm in detail. (16)
2. Perform heap sort for the given values as input 142, 543, 123, 434, 242, 811, 102, 65, 879, 572, 111, 453. (16)
3. Explain how the merge sort works. (16)
4. Write an algorithm for Quick and Shell sort. (16)
5. Discuss briefly about the external sorting. (16)

**UNIT – 5****GRAPHS****PART-A (2Marks)**

1. Define Graph.
2. How graph differ from tree.
3. What is minimum spanning tree? Name any two algorithm used for MST.
4. In Real time, where we used the graph concept (any two examples).
5. What is meant by DFS.
6. What is meant by BFS.
7. Define Topological sort.
8. What is meant by undirected graph?
9. Define NP completeness
10. How we find shortest path.

**PART-B**

1. Discuss about topological sorting. (16)
2. Analysis Prim's algorithm. (16)
3. Explain about Kruskal's algorithm. (16)
4. Explain about Dijkstra's algorithm using the following graph. Find the shortest path between V1 to V2, V3, V4, V6, V7. (16)
5. Explain BFS and DFS algorithm. (16)

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