SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
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MODEL QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures(19MC9106)   **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem   **Regulation:** R19

1. What is Performance Analysis? Explain components of Space Complexity.   [12 M]

2. Explain Time Complexity with their components and examples.   [12 M]

3. Discuss in detail about Algorithm Specification.   [12 M]

4. Explain Best, Average and Worst operation counts for various algorithms.   [12 M]

5. a) What do you mean by Asymptotic Notation?   [06 M]

   b) Explain Big Oh Notation. With example   [06 M]

6. a) Explain Omega Notation. With example   [06 M]

   b) Explain Theta Notation. With example   [06 M]

7. Explain Abstract Data Type and Abstract Class in Linear List   [12 M]

8. Explain how can we represent Linear list Array   [12 M]

9. a) Explain Linear Data structure with examples   [06 M]

   b) Explain Non Linear Data structure with examples   [06 M]

10. What are the various performance measurement for an array list?   [12 M]

UNIT-II

LINKED LIST, STACKS AND QUEUES

1. What is linked list? Write and explain the algorithm for create and traverse operations in single linked list with example. [12 M]

2. What are the draw backs of single linked list? Write and explain the algorithm for search and modify operations in doubly linked list with example. [12 M]

3. a). Explain the advantages of linked list over arrays. [6 M]

   b). Write algorithm for insert and delete a node from doubly linked list. [6 M]

4. a). Explain the circular linked list in detail. [6 M]

   b). What is the draw backs of single linked list? Explain how to implement insert and traverse operations in circular linked list. [6 M]

5. What is linked list? Write and explain the algorithm for crate, insertion and traverse operations in doubly linked list with example. [12 M]

6. What is stack? Explain any two applications of stack with examples. [12 M]

7. What is stack? Write algorithm for operations of stack with examples. [12M]

8. What are the limitations of queue? Explain the algorithms for various operations of circular queue. [12 M]

9. Give brief description about the priority queues. [12 M]

10. a). What are the applications of queue? [6 M]

    b). How to store stack using linked list? Explain with example. [6 M]

UNIT-III

TREES, MULTIWAY TREES

1. a) What is a binary search tree? How do you insert an element into a binary search tree?

[6 M]

b) What is traversing? Write recursive procedure for in order traversal in a binary tree.

[6 M]

2. a). Explain how to delete an element from the binary search tree. [6 M]

b). Write recursive algorithm for pre order traversal. [6 M]

3. a). Discuss threaded binary trees. [6 M]

b). Explain height balance tree. [6 M]

4. Discuss about Heaps and heaps as priority Queues. [12 M]

5. Write insertion, deletion and searching operations on AVL trees. [12 M]

6. Discuss B-Trees with insert and delete operations. [12 M]

7. Explain B+ - Tree and Prefix B+ - Trees. With differences. [12 M]

8. Explain about 2-4 trees with various operations. [12 M]

9. Explain B* - Trees and Bit – Trees. With example [12 M]

10. Explain Deletion in Binary tree by merging and copying [12 M]

UNIT –IV
SORTING AND SEARCHING

1. Explain how to sort the elements by using insertion sort and derive time complexity for the same. [12 M]

2. Write a Routine for sorting elements using quick sort method. Explain the working of the routing with an example. [12 M]

3. Explain how to sort the elements by using selection sort and derive the time complexity for the same. [12 M]

4. Discuss the Algorithm of merge sort with an example. Derive its time complexity.
[12 M]

5. Write and explain Bubble sorting Algorithm and also find its time complexity. [12 M]

6. Write and explain Radix sort algorithm with an example. [12 M]

7. What is searching? Explain Binary search algorithm with example and also find its time complexity. [12 M]

8. What is searching? Explain Linear search algorithm with example and also find its time complexity. [12 M]

9. Define Searching. Differentiate the time complexities of Linear and Binary search with examples. [12 M]

10. Write a procedure for sorting a given list of elements using Quick sort method. Show the division of the list in the quick sort for a list of 10 numbers. [12 M]

UNIT-V

GRAPHS AND GRAPH ALGORITHMS

1. Explain DFS algorithm with example.   [12 M]

2. Explain BFS algorithm with example.   [12 M]

3. Discuss how to represent graph storage using Adjacency matrix.   [12 M]

4. What is minimum –cost spanning tree? Discuss Prim's algorithm with example.   [12 M]

5. What is minimum –cost spanning tree? Discuss Kruskal's algorithm with example.[12 M]

6. Explain Dijkstra's algorithm with an example.   [12 M]

7. Discuss Floyd's algorithm.   [12 M]

8. With an example discuss Warshall's algorithm.   [12 M]

9. Define graph. Explain various operations on graphs.   [12 M]

10. Explain any algorithm for all pairs shortest path problem.   [12 M]