SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures(16MC806) **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem **Regulation:** R16

UNIT –I

Sorting, Searching and Directories

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 Binary search algorithm with example and also find its time complexity. [12 M]
9. Define hashing function. Explain any two Hashing functions 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]

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures (16MC806) **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem **Regulation:** R16

UNIT-II

Linked List and Applications of Linked List

1. What is linked list? Write and explain the algorithm for crate 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. a). What is sparse matrix? Write an algorithm for implement sparse matrix. [6 M]
   b). write an algorithm for insertion operation in circularly doubly linked list. [6 M]
6. What is Linked list? Explain applications of linked list. [6 M]
7. a). Discuss in detail about the polynomial representation. [6 M]
   b). Explain with suitable example, the sort operation of single linked list. [6 M]
8. a). Explain the doubly linked list in detail. [6 M]
   b). Explain creation and deletion operations in circular linked list. [6 M]
9. What is linked list? Write and explain the algorithm for crate, insertion and traverse operations in doubly linked list with example. [12 M]
10. What are the draw backs of arrays? Write and explain the algorithm for search and modify operations in single linked list with example. [12 M]

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures (16MC806) **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem **Regulation:** R16

UNIT-III

Stacks and Queues

1. a). Explain the solution to the towers of Hanoi problem. Assume the number of disks as three. [6 M]
   b). How to store the stack using arrays? Explain with example. [6 M]
2. Write a procedure to convert an infix expression into postfix form. Explain it by an example. [12 M]
3. What is stack? Explain any two applications of stack with examples. [12 M]
4. What is stack? Write algorithm for operations of stack with examples. [12M]
5. What are the limitations of queue? Explain the algorithms for various operations of circular queue. [12 M]
6. Give brief description about the priority queues. [12 M]
7. What is double ended queue? Discuss the operations of Double ended queue. [12 M]
8. a). What are the applications of queue? [6 M]
   b). How to store stack using linked list? Explain with example. [6 M]
9. What are priority queues? Explain in detail with example. [12 M]
10. a). Write a function that returns the ncr value using recursive function. [6 M]
    b). Write any four applications of queues. [6 M]

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures(16MC806) **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem **Regulation:** R16

UNIT-IV

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 Red-Black and Splay trees. [12 M]

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

6. Discuss B-Trees. [12 M]

7. What is binary search tree? How to implement searching and insertion operations on Binary search tree. [12 M]

8. What is binary search tree? How to implement recursive traversal techniques on binary search tree. Discuss with an example. [12 M]

9. What is B-tree of order m.? Write insertion and deletion operations on the same. [12 M]

10. What is heap? Explain algorithm for heap sort with an example. [12 M]

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : Data Structures(16MC806) **Course & Specialization**: MCA

Year & Sem: I-MCA & II-Sem **Regulation:** R16

UNIT-V

Graphs and Graphs 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]

Prepared by: S.Choudaiah, Professor, Dept. of MCA