

UNIT – III
Short Answer Questions

1. What are dictionaries? Briefly explain the operations that are performed on them.
2. Explain how dictionaries can be represented using skip lists.
3. Explain the insertion and deletion operations on a skip list.
4. Explain about hashing, hash table and hash function with example.
5. What objective should be sought in the design of a hash function?
6. What are the major application of hash table?
7. Explain various collision resolution techniques in Hashing.
8. Define a binary search tree.
9. What is a degenerated tree.
10. What is a strictly binary tree?
11. Write the difference between fully, strictly, complete binary tree.

Essay Questions

1. Given the input
{4371, 1323, 6173, 4199, 4344, 9679, 1989} and hash function
 $h(x) = x \bmod 10$ show the result for following:
 - (a) Separate chaining hash table
 - (b) open addressing hash table using linear probing
 - (c) open addressing hash table using quadratic probing
 - (d) open addressing hash table using with second hash function
 $h_2(x) = 7 - (x \bmod 10)$
2. Explain about various open addressing hashing mechanism with example
3. Implement search function for hashing using Generics
4. Implement insert function for hashing using Generics
5. Explain about separate chaining hashing mechanism with example.
6. Implement Chained Hash Tables in JAVA.
7. Implement insertion into a binary search tree using Generics.
8. Implement deletion from a binary search tree using Generics.
9. Implement searching algorithm of a binary search tree using Generics.
10. Construct the binary search tree from following set of strings March, May, Nov., August, April, January, December, July, February, June, October, September. Show all the steps.
11. Implement a sorted list using Generics
12. Write the code for SkipNode and SkipList.
13. What are Stream Intermediate operations and Explain map(), filter(), distinct(), sorted(), limit(), skip()
14. Explain Terminal operations – forEach(), reduce(), collect(), min(), max(), count().

UNIT – V
Short Answer Questions

1. Define a circular queue.
2. When is a circular queue full?
3. Define a Priority queue.
4. Define a deque.
5. Define a heap.
6. Define a max heap
7. Define a min heap
8. Define B tree.
9. List out the properties of B Tree.
10. List out the operations on B Tree.
11. Define max and min heaps, realizing, operations-insertion, deletion, and their Implementation using user-defined generic classes, heap sort and its implementation using user-defined generic classes.
12. Explain max heap construction.
13. Explain the importance of priority queues using heaps.
14. List the operations heap.
15. Define a heap sort.
16. List the operations heap sort.



UNIT - IV
Short Answer Questions

1. What is an AVL tree?
2. List the rotations in AVL tree.
3. What are balanced trees?
4. List the rotations in AVL tree.
5. What is an indexed binary search tree?
6. Define height of an AVL tree.
7. Give an example for RR rotation.
8. Give an example for LL rotation.
9. Give an example for RL rotation.
10. What is an m-way search tree?
11. List the applications of a red-black tree.
12. List the operations on a red-black tree.

Essay Questions

1. Implement insertion into a AVL tree using Generics.
2. Implement deletion from a AVL tree using Generics.
3. Implement searching algorithm of a AVL tree using Generics.
4. Explain the RR rotation of AVL tree.
5. Explain the RL rotation of AVL tree.
6. Explain the LR rotation of AVL tree.
7. Explain the LL rotation of AVL tree.
8. List the properties of a m-way search tree.
9. Explain the search operation in Red Black Search trees.
10. Explain the Insertion operation in Red Black Search trees.
11. Explain the deletion operation in Red Black Search trees.

UNIT - V

UNIT-IV

Short Answer questions:

1. What is binary representation?
2. Define ASCII
3. What is the purpose of EBCDIC?
4. Define NAND gate.
5. What is gray code?
6. What is fixed point representation?
7. List the challenges associated with fixed-point arithmetic.
8. Provide an example of fixed-point number representation
9. How is addition performed in fixed -point arithmetic?
10. Explain the concept of fractional Bits

Long Answer Questions:

1. Explain the basics of floating- point representations.
2. Elaborate the concept of precision and overflow in floating-point arithmetic.
3. List and challenges of floating-point arithmetic
4. Explain various types of data representations in Computer architecture.
5. What are the error detection and correction codes in data representations?
6. Explain decimal arithmetic principles and its applications.
7. Explain the arithmetic instructions with an example.
8. Explain the basic multiplication algorithm for unsigned integers.
9. Elaborate complexity and advantages of Booth's algorithm
10. Discuss applications of Booth's algorithm in binary multiplication.

UNIT-V