

UNIT – I

- 1) What is external sorting? Briefly describe basic (two-way) merge.
- 2) Discuss briefly about the procedure of sorting using multi-way merge
- 3) Discuss briefly about the procedure of multi-way merge with a program?
- 4) Propose an algorithm to sort a large file using only two tapes.
- 5) Propose an algorithm to sort a large file using k tapes.
- 6) Discuss briefly about the procedure of multi-way merge with an example.
- 7) Explain about Buffer Handling for Parallel Operation.
- 8) Explain about run generation.
- 9) Explain about optimal merging of runs.
- 10) What is external sorting? Briefly describe k-way merge.

UNIT – II

1. a) Discuss the Problems associated with Quadratic probing.
b) Discuss the Advantages of hashing.
d) Compare Closed hashing Vs Open hashing.
2. a) How will you handle overflow and collision detection in a hash table? Discuss methods.
b) Construct the open hash table and closed hash table for the input:
30, 20, 56, 75, 31, 19 using the hash function $h(k) = k \bmod 11$.
3. a) Explain the linear probing method in hashing. Discuss its performance analysis.
b) What is hashing with chains? Explain. Compare this with linear probing.
4. a) Discuss about closed hashing with examples.
b) Discuss about various Hashing functions with examples.
5. a) Analyze the insertion and deletion operations in closed hashing.
b) What is hash table? Discuss about the hashing techniques.
6. a) With a procedure and a relevant example discuss separate chaining in hashing.
b) Explain about directory less dynamic hashing.
7. a) The Keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function $h(k) = k \bmod 10$ and linear probing. What is the resultant hash table?
b) What do you mean by hashing? Why do we need it?
8. a) Explain the different collision resolution strategies for hashing. State the advantages and disadvantages of each technique.
b) Apply the division method to get the hash index of table size 23 for following keys - 68738, 22567, 38624, 63289, 81346.
9. a) Apply the folding method to get the hash index of table size 79 for following keys - 56497, 79256, 27143, 49239, 18942, 77722.
b) Discuss about secure hash functions.
10. a) Explain about dynamic hashing using directories.
b) Apply the mid square method to get the hash index of table size 97 for following keys - 1123, 1234, 1012, 1034, 1103, 1005.

UNIT – III

1. a) Discuss basic model of priority queue.
b) Write the Applications of priority queue.
c) Give the properties of binomial heap.
d) The elements 32, 15, 20, 30, 12, 25 and 16 are inserted one by one in the given order into a max-heap. What is the resultant Max-heap?
2. a) Write a routine for creating a binary heap and also explain with example.
b) Explain structure property and order property of heap.
3. a) Construct a heap using the following list of numbers: 12,9,8,3,7,5,10,18.
b) What is a priority queue? List and explain implementations of priority queue.
4. a) Discuss the insertion operation of heap.
b) Illustrate the algorithm for deletion of an element from heap with an example.
5. a) Discuss briefly about binomial trees.
b) Explain the implementation of a binomial heap and its operation with suitable example.
6. a) Explain about other heap operations.
b) Explain about the procedure for deleteMin from Binary Heap.
7. a) Explain about Binomial queue operations.
b) What are the properties of Binary Heap?
8. a) Explain about the selection problem using priority queue.
b) Construct the Binary Heap for the following data with neat diagrams - 4, 67, 23, 89, 12, 8, 7, 44, 78, 64, 70, 17
9. a) What is Binomial Queue? Discuss.
b) What operations that can be performed on Binomial Queues? Explain.
10. a) Explain Event Simulation using priority queue.
b) Write a routine to insert an element into a binary heap.