MCQs

Q.1 Suppose T is a binary tree with 14 nodes, then what is the minimum possible depth of the binary tree?

a. 0

b. 3

c. 5

d. 4

Answer. 3

Q.2 What is the average retrieval time when n keys hash to the same slot?

a. Theta(n)

b. Theta(n^2)

c. Theta(nlog n)

d. Big-Oh(n^2)

Answer. Theta(n)

Q.3 What is the search complexity in direct addressing?

a. O(n)

b. O(logn)

c. O(nlogn)

d. O(1)

Answer. O(1)

Q.4 The case in which a key other than the desired one is kept at the identified location is called?

a. Hashing

b. Collision

c. Chaining

d. Open addressing

Answer. Collision

Q.5 Consider any array representation of an n element binary heap where the elements are stored from index 1 to index n of the array. For the element stored at index i of the array (i <= n), the index of the parent is

a. i - 1

b. floor(i/2)

c. ceiling(i/2)

d. (i+1)/2

Answer. floor(i/2)

Q.6 What data organization method is used in hash tables?

a. Stack

b. Array

c. Linked list

d. Queue

Answer. Linked list

Q.7 What is the hash function used in Double Hashing?

a. (h1(k) – i*h2(k))mod m

b. h1(k) + h2(k)

c. (h1(k) + i*h2(k))mod m

d. (h1(k) + h2(k))mod m

Answer. (h1(k) + i*h2(k))mod m

Q.8 On performing hash by digit folding for two fold , what will be hash value for key 1234567

a. 109

b. 28

c. 100

d. None of these

Answer. 109

Q.9 Suppose we are sorting an array of eight integers using heapsort, and we have just finished some heapify (either maxheapify or minheapify) operations. The array now looks like this: 16 14 15 10 12 27 28 How many heapify operations have been performed on r

a. 1

b. 2

c. 3

d. 4

Answer. 2

Q.10 How many steps are involved in creating a hash function using a multiplication method?

a. 1

b. 2

c. 3

d. 4

Answer. 2

Q.11 During hash generation: if the hashmap size is extremely large we can say that the amount of time taken for hashing the key K would be negligible i.e. the time complexity for hash computation will be __

a. theta n

b. theta 1

c. Cant say

d. None of these

Answer. theta 1

Q.12 A 3-ary max heap is like a binary max heap, but instead of 2 children, nodes have 3 children. A 3-ary heap can be represented by an array as follows: The root is stored in the first location, a[0], nodes in the next level, from left to right, is stored fr

a. 1, 3, 5, 6, 8, 9

b. 9, 6, 3, 1, 8, 5

c. 9, 3, 6, 8, 5, 1

d. 9, 5, 6, 8, 3, 1

Answer. 9, 5, 6, 8, 3, 1

Q.13 Whcih of the following statement is true ?

a. Every binary tree is either complete or full

b. Every complete binary tree is also a full binary tree

c. Every binary tree is also a complete binary tree

d. No binary tree is both complete and full

Answer. Every binary tree is also a complete binary tree

Q.14 A good hash approach is to derive the hash value that is expected to be dependent of any patterns that might exist in the data.

a. TRUE

b. FALSE

c.

d.

Answer. FALSE

Q.15 In a binary max heap containing n numbers, the smallest element can be found in time

a. O(nLogn)

b. O(n^2)

c. O(Logn)

d. O(n)

Answer. O(n)

Q.16 What is the value of h(k) for the key 123456?

Given: p=14, s=2654435769, w=32

a. 123

b. 456

c. 70

d. 67

Answer. 67

Q.17 Using mod method, in a given hash table of size 157, the key of value 172 be placed at position _____

a. 19

b. 72

c. 15

d. 17

Answer. 15

Q.18 Which of the following is not a technique to avoid a collision?

a. Make the hash function appear random

b. Use the chaining method

c. Use uniform hashing

d. Increasing hash table size

Answer. Increasing hash table size

Q.19 Which technique has the greatest number of probe sequences?

a. Linear probing

b. Quadratic probing

c. Double hashing

d. Closed hashing

Answer. Double hashing

Q.20 In simple uniform hashing, what is the search complexity?

a. O(n)

b. O(logn)

c. O(nlogn)

d. O(1)

Answer. O(1)

Q.21 In simple chaining, what data structure is appropriate?

a. Singly linked list

b. Doubly linked list

c. Circular linked list

d. Binary trees

Answer. Doubly linked list

Q.22 What is the hash function used in multiplication method?

a. h(k) = floor(m(kA mod 1))

b. h(k) = ceil(m(kA mod 1))

c. h(k) = floor(kA mod m)

d. h(k) = ceil(kA mod m)

Answer. h(k) = floor(m(kA mod 1))

Q.23 Which hash function satisfies the condition of simple uniform hashing?

a. h(k) = lowerbound(km)

b. h(k)= upperbound(mk)

c. h(k)= lowerbound(k)

d. h(k)= upperbound(k)

Answer. h(k) = lowerbound(km)

Q.24 What is the running time of double hashing?

a. Theta(m)

b. Theta(m^2)

c. Theta(m log k)

d. Theta(m^3)

Answer. Theta(m)

Q.25 What is simple uniform hashing?

a. Every element has equal probability of hashing into any of the slots

b. A weighted probabilistic method is used to hash elements into the slots

c. Elements has Random probability of hashing into array slots

d. Elements are hashed based on priority

Answer. Every element has equal probability of hashing into any of the slots

Q.26 Collisions can be reduced by choosing a hash function randomly in a way that is independent of the keys that are actually to be stored.

a. TRUE

b. FALSE

c.

d.

Answer. TRUE

Q.27 Which scheme uses a randomization approach?

a. hashing by division

b. hashing by multiplication

c. universal hashing

d. open addressing

Answer. universal hashing

Q.28 What can be the value of m in the division method?

a. Any prime number

b. Any even number

c. 2p – 1

d. 2p

Answer. Any prime number

Q.29 Which of the following statement is false about the binary tree?

a. Every BT has atleast 1 node

b. Every non empty tree has exactly one root node

c. Every node has atmost two children

d. Every non root node has exactly one parent

Answer. Every BT has atleast 1 node

Q.30 Consider a binary max-heap implemented using an array. Which one of the following array represents a binary max-heap?

a. 25,12,16,13,10,8,14

b. 25,12,16,13,10,8,14

c. 25,14,16,13,10,8,12

d. 25,14,12,13,10,8,16

Answer. 25,14,16,13,10,8,12

Q.31 The value of h2(k) can be composite relatively to the hash table size m.

a. TRUE

b. FALSE

c.

d.

Answer. FALSE

Q.32 What is the hash function used in the mod method?

a. h(k) = k/m

b. h(k) = k mod m

c. h(k) = m/k

d. h(k) = m mod k

Answer. h(k) = k mod m

Q.33 What is direct addressing?

a. Distinct array position for every possible key

b. Fewer array positions than keys

c. Fewer keys than array positions

d. Same array position for all keys

Answer. Distinct array position for every possible key

Q.34 What is a hash table?

a. A structure that maps values to keys

b. A structure that maps keys to values

c. A structure used for storage

d. A structure used to implement stack and queue

Answer. A structure that maps keys to values

Q.35 Double hashing is one of the best methods available for open addressing.

a. TRUE

b. FALSE

c.

d.

Answer. TRUE

Q.36 What is the time complexity of Build Heap operation. Build Heap is used to build a max(or min) binary heap from a given array. Build Heap is used in Heap Sort as a first step for sorting.

a. O(nLogn)

b. O(n^2)

c. O(Logn)

d. O(n)

Answer. O(n)

Q.37 Given two max heaps of size n each, what is the minimum possible time complexity to make a one max-heap of size from elements of two max heaps?

a. O(nLogn)

b. O(n^2)

c. O(Logn)

d. O(n)

Answer. O(n)

Q.38 If several elements are competing for the same bucket in the hash table, what is it called?

a. Diffusion

b. Replication

c. Collision

d. Duplication

Answer. Collision

Q.39 What is a hash function?

a. A function has allocated memory to keys

b. A function that computes the location of the key in the array

c. A function that creates an array

d. A function that computes the location of the values in the array

Answer. A function that computes the location of the key in the array

Q.40 What is the advantage of the multiplication method?

a. only 2 steps are involved

b. using constant

c. value of m not critical

d. simple multiplication

Answer. value of m not critical