

Question 1 Which one is the negative side effect of linear probing?

- A Too many values hash to the same key and hence create long chain
- B Too many linked lists in the table which increases the time complexity
- C Too many values, all hash to the same area of the hash table and cause clustering
- D None of these

Answer C

Question 2 Given the input 311, 313, 143, 129, 314, 679, 989 and hash function $h(X)=X \bmod 10$. The number 989 will be placed at index using quadratic probing _____?

- A 8
- B 9
- C 0
- D 1

Answer A

Question 3 Given the input 311, 313, 143, 129, 314, 679, 989 and hash function $h(X)=X \bmod 10$. The number 679 will be placed at index using quadratic probing _____?

- A 8
- B 9
- C 0
- D 1

Answer C

Question 4 Given the input 311, 313, 143, 129, 314, 679, 989 and hash function $h(X)=X \bmod 10$. The number 314 will be placed at index using quadratic probing _____?

- A 3
- B 4
- C 5
- D 6

Answer C

Question 5 Consider a hash table of size 7 and hash function $h(k)=k \bmod 7$. Calculate the number of collisions with Linear Probing for Insertion of following keys: 29,36,16,30

- A 2
- B 3
- C 8
- D 9

Answer B

Question 6 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 C

Question 7 Which open addressing technique is free from clustering problems

- A. Linear probing
- B. Quadratic probing
- C. Double hashing
- D. None of the above

Answer C

Question 8 Which of the following problems occur due to linear probing?

- A. Primary collision
- B. Secondary collision
- C. Separate chaining
- D. Extendible hashing

Answer A

Question 9 A hash table of length 10 uses open addressing with hash function $h(k)=k \bmod 10$, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

10 Which one of the following choices gives a possible order in which the key values could have been inserted in the table?

- A** 46, 42, 34, 52, 23, 33
- B** 34, 42, 23, 52, 33, 46
- C** 46, 34, 42, 23, 52, 33
- D** 42, 46, 33, 23, 34, 52

Answer C

Question 11 Which of the following methods suffer from the problem of secondary clustering.?

- A. Linear Probing**
- B. Quadratic Probing**
- C. Double Hashing**
- D. Key Offset**

Answer B

Question 12 The keys 1,5,28,19,15,20,33,12,17,10 are inserted into a hash table of size 4 in which collision resolution is done by separate chaining. If the hash function, $h(k)=k \bmod 4$. What is the length of the longest chain?

- A.1**
- B.2**
- C.3**
- D.4**

Answer D

Question 13

Id	
Question	Folding is a method of generating
A	A hash function
B	Index function for a triangular matrix

C	Linear probing
D	Chaining.
Answer	A
Marks	1

Question 14

Id	
Question	What is the hash key of 954 if hash function is $x\%3$?
A	0
B	3
C	4
D	318

Answer	A
Marks	1

Question 15

Id	
Question	What is the hash key of 955 if hash function is $x\%3$?
A	0
B	3
C	1
D	318
Answer	C
Marks	1

Question 16

Id	
Question	What is the hash key of 999 if hash function is $x\%3$?
A	11
B	111
C	0
D	318
Answer	C
Marks	1

Question 17

Id	
Question	What is the hash key of 554 if hash function is $x\%3$?

A	0
B	2
C	3
D	184
Answer	B
Marks	1
Unit	3

Question 18

Question A hash function f defined as $f(\text{key}) = \text{key} \bmod 7$, with linear probing, insert the keys 51, 38, 16, 55, 98, 18, 56, into a table indexed from 56 will be stored in the location

- A 1
- B 3
- C 5
- D 6

Answer A
Marks 2

Question 19

What is the search complexity in direct addressing?

- a) $O(n)$
- b) $O(\log n)$
- c) $O(n \log n)$
- d) $O(1)$

Answer: d

Mark:1

Question 20 In simple chaining, what data structure is appropriate?

- a) Singly linked list
- b) Doubly linked list
- c) Circular linked list
- d) Binary trees

Answer: b

Mark:1

Question 21 Double hashing is a technique in which _____

- a. Second hash function is applied
- b. Chains are used
- c. Table size is changed
- D. None of these

Answer: a

Mark:1

Question 22 Requirement of additional data structure is the drawback of

- a. Chaining
- b. Double hashing
- c. Linear probing
- d. Quadratic probing

Question 23

In hashing, collision resolution is done by using close addressing. Which of the following is close addressing technique?

- 1) Chains (for linked storage)
- 2) Buckets (for contiguous storage)

- A. Only 1
- B. 1 and 2
- C. Only 2
- D. none

Answer: A

Mark: 1

Question 24

In simple uniform hashing, what is the search complexity?

- A. $O(n)$**
- B. $O(\log n)$**
- C. $O(n \log n)$**
- D. $O(1)$**

Answer: D

Mark: 1

Question 25

Consider a hash table of size $m=12$ and a corresponding hash function $h(\text{key}) = \text{key} \bmod 12$, where value of index is calculated using mid-square method. Compute the location to which the key 73 is mapped. And index of hash table starts from 0.

- a. 3**
- b. 1**
- c. 32**
- d. 6**

Answer: c

Mark: 3

Question 26

In hash table, Overflow occurred when

- a. collision occurs**
- b.Hash table is full**
- c. hash table is empty**
- d. None of the above**

Answer: a

Mark: 1

Question 27

Id	
Question	<p>A key is broken into several parts. Each part has the same length as that of the required address except the last part. The parts are added together, ignoring the last carry, we obtain the hash address for key K.</p> <p>Which hash function is this?</p>
A	Division method
B	Mid square method
C	Folding method

D	Digit analysis
Answer	C
Marks	1
Unit	3

Question 28

Id	
Question	A skip list is built in
A	0 layer
B	1 layer
C	Multiple layers
D	None

Answer	C
Marks	1

Question 29

Question	Dictionary can be implemented using
A	Hashtable
B	Singly Linked List
C	Binary Search Tree
D	All of the above
Answer	D
Marks	1

Question 30 The keys 1,5,28,19,15,20,33,12,17,10 are inserted into a hash table of size 7 in which collision resolution is done by separate chaining. If the hash function, $h(k)=k \bmod 7$. What is the length of the longest chain?

A.1

B.2

C.3

D.4

Answer D

Question 31 The keys 1,5,28,19,15,20,33,12,17,10 are inserted into a hash table of size 5 in which collision resolution is done by separate chaining. If the hash function, $h(k)=k \bmod 5$. What is the length of the longest chain?

A.1

B.2

C.3

D.4

Answer D

Question 32

Id	
Question	The bottom layer in Skip List is an ordinary ordered ----
A	Linked list

B	Array
C	It depends
D	None
Answer	A
Marks	1

Question 33

Question	Consider a hash table of size eight, with starting index zero, and a hash function $(4x + 3) \bmod 8$. Assuming the hash table is initially empty, which of the following is the contents of the table when the sequence 1, 3, 8, 10 is inserted into the table using closed hashing? Note that ‘_’ denotes an empty location in the table.
A	3, _, _, 10, _8, _,1
B	1, 8, 3, _, _, _, 10
C	1, _, _, 3, _, 8, 10

D	1, 10, 8, _, _, _, 3
Answer	A
Marks	2

Question 34. The keys 1,5,28,19,15,20,33,12,17,25 are inserted into a hash table of size 10 in which collision resolution is done by separate chaining. If the hash function, $h(k)=k \bmod 10$. What is the length of the longest chain?

A.1

B.2

C.3

D.4

Answer C

Question 35. Consider a hash table of size 7, with starting index 0 and the hash function $(3x+4) \bmod 7$. Assuming the hash table is initially empty, which of the following is the contents of the table when the sequence 1,3,8,10 is inserted into the table using closed hashing? Note that _ denotes an empty location in the table

A. 8,_,_,_,_,_,10

B. 1,8,10,_,_,_,3

C. 1,_,_,_,_,_,3

D. 1,10,8,_,_,_,3

Answer: B

Question 36. Consider a hash table of size 7, with starting index 0 and the hash function $(2x+4)\text{mod } 7$. Assuming the hash table is initially empty, which of the following is the contents of the table when the sequence 1,3,8,10 is inserted into the table using closed hashing? Note that _ denotes an empty location in the table

E. 8,_,_,_,_,10

F. 8,_,_,3,10,_,1

G. 1,_,_,_,_,3

H. 1,10,8,_,_,_3

Answer: B

Question 37

Question	Consider a hash table of size eight, with starting index zero, and a hash function $(2x + 4) \text{ mod } 8$. Assuming the hash table is initially empty, which of the following is the contents of the table when the sequence 1, 3, 8, 10 is inserted into the table using closed hashing? Note that ‘_’ denotes an empty location in the table.
A	10,1,_,3,_,_,_,8
B	1,_,3,_,_,_,8,10
C	10,_,3,8,_,_,1,_
D	10,_,1,_,3,_,_,8
Answer	C

Marks	3
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Question 38

Consider inserting keys 10,22,31,4,15,28,17,88 using open addressing technique into a hash table of length $m=11$ with hash function $h(k)=k \bmod 11$. What is the number of collisions encountered?

- A. 2
- B. 3
- C. 4
- D. 7

Answer : B

Question 39

Consider inserting keys 10,32,31,14,15,28,37,78 using open addressing technique into a hash table of length $m=11$ with hash function $h(k)=k \bmod 11$. What is the number of collisions encountered?

- A. 2
- B. 3
- C. 4
- D. 7

Answer : A

Question 40

Consider inserting keys 20,32,42,28,15,72,86 using Quadratic Probing technique into a hash table of length $m=11$ with hash function $h(k)=k \bmod 11$. What is the number of collisions encountered?

- A. 2
- B. 3
- C. 4
- D. 7

Answer : B

Question 41

Consider inserting keys 20,32,42,28,15,72,86 using Quadratic Probing technique into a hash table of length $m=11$ with hash function $h(k)=k \bmod 11$. How many probes required to search 86 in the hash table

- A. 2**
- B. 3**
- C. 4**
- D. 7**

Answer : C

Question 42

Are the below statements true about skiplists?

In a sorted set of elements skip lists can implement the below operations

i.given a element find closest element to the given value in the sorted set in $O(\log n)$

ii.find the number of elements in the set whose values fall a given range in $O(\log n)$

- a. True**
- b. False**
- c. May be**
- d. Cant say**

Answer: A

Question. 43

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?

Answers to be copied from Vidya

Question. 44

Id

Question A

hash function must have

- A Minimum collisions
- B Easy and quick to compute
- C Distribute the keys evenly over hash table
- D All of above

Answer D

Marks 1

Question. 45

The goal of hashing is to produce a search that takes

- A. $O(1)$ time
- B. $O(n^2)$ time
- C. $O(\log n)$ time
- D. $O(n \log n)$ time

Answer: A

Question. 46

If you are using double hashing and functions to find the key index is: $\text{Hash1}(\text{key}) = \text{key} \% \text{Hash_table_size}$

$\text{Hash2}(\text{key}) = M - (\text{Key} \% M)$, then 37,90,45,22,49,17 inserted into an initially empty hash table of size 10. At what index 17 will be inserted?

- A. 0
- B. 1
- C. 3
- D. 4

Answer 4

Question. 47

If you are using double hashing and functions to find the key index is: $\text{Hash1}(\text{key}) = \text{key} \% \text{Hash_table_size}$

$\text{Hash2}(\text{key}) = M - (\text{Key} \% M)$, then 37,90,45,22,49,18 inserted into an initially empty hash table of size 10. At what index 18 will be inserted?

- a. 0
- b. 1
- c. 3
- d. 4

Answer c

Question. 48

Consider a hash table with 9 slots. The hash function is $h(k) = k \bmod 9$. The collisions are resolved by chaining. The following 9 keys are inserted in the order: 5, 28, 19, 15, 20, 33, 12, 17, 10. The maximum, minimum, and average chain lengths in the hash table, respectively, are

- A. 3,0,and 1
- B. 3,3,and 3
- C. 4,0,and 1
- D. 3,0,and 2

Answer A

Marks 3