

survival8

BITS WILP Data Structures and Algorithms Design Quiz-3 2017-H1

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Question 1

Consider the experiment of tossing a coin until 10 heads appear. Then expected number of tosses is

Select one:

- ☐ a. 2
☒ b. 20
☐ c. None of the above
☐ d. 11
☐ e. 10

Feedback

The correct answer is: 20

Question 2

Total number of comparisons needed for merge(L1,L2) where L1 is 2,4,6,8 and L2 is 10, 12, 13,15, 17,19

Select one:

- ☐ a. 6
☐ b. 10
☐ c. 9
☐ d. None of the above
☒ e. 4

Feedback

The correct answer is: 4

Question 3

Consider the problem of sorting a sequence in ascending order. If the input is already in ascending order, which of the following sorting procedure is most efficient.

Select one:

- ☐ a. Merge Sort
☐ b. Quick Sort
☐ c. Heap Sort
☐ d. None of the above
☒ e. Insertion Sort

Feedback

The correct answer is: Insertion Sort

Question 4

Suppose the input to Quick sort is 1,2,...17. What would be the best pivot element during the first invocation?

Select one:

- ☒ a. 9
☐ b. 1
☐ c. None of the above
☐ d. 2

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☐ e. 17

Feedback

The correct answer is: 9

Question 5

Let G be a simple undirected graph with n vertices. Then number of edges in G is

Select one:

- ☐ a. at least $n(n-1)/2$
☐ b. at least n
☐ c. at most n
☐ d. None of the above
☒ e. at most $n(n-1)/2$

Feedback

The correct answer is: at most $n(n-1)/2$

Question 6

Let T be a tree with m edges. Then the number of vertices in T is

Select one:

- ☐ a. None of the above
☒ b. exactly $m+1$
☐ c. exactly m
☐ d. exactly $m-1$
☐ e. at most m

Feedback

The correct answer is: exactly $m+1$

Question 7

Let A be an adjacency matrix of an undirected graph in G . Then sum of all entries in the matrix is equal to

Select one:

- ☐ a. Number of edges in G
☐ b. Number of vertices in G
☒ c. Twice the number of edges in G
☐ d. None of the above
☐ e. Twice the number of vertices in G

Feedback

The correct answer is: Twice the number of edges in G

Question 8

Worst case running time for quick sort is

Select one:

- ☐ a. $O(n \log n)$
☒ b. $O(n^2)$
☐ c. None of the above
☐ d. $O(n)$
☐ e. $O(\log n)$

Feedback

The correct answer is: $O(n^2)$

Question 9

Suppose an undirected graph, which has n vertices and d maximum degree, is represented using adjacency list. The running time to find the degree of a given vertex is

Select one:

- ☒ a. $O(d)$
☐ b. $O(1)$
☐ c. $O(\log n)$
☐ d. $O(n)$
☐ e. None of the above

Feedback

The correct answer is: $O(d)$

Question 10

Consider the experiment of tossing a coin until a head appears. The number of elements in the sample space is

Select one:

- ☒ a. None of the above
☐ b. 0
☐ c. 4
☐ d. 2
☐ e. 1

Feedback

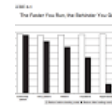
The correct answer is: None of the above

Question 11

Suppose a directed graph is represented using adjacency list. The running time to calculate indegree of a vertex is

Select one:

- ☐ a. $O(\log n)$
☐ b. None of the above
☐ c. $O(m+n)$
☒ d. $O(n)$



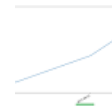
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☐ e. $O(d)$

Feedback

The correct answer is: $O(n)$

Question 12

Which of the following statements is correct.

- i) Any comparison based algorithm must perform $\Omega(n \log n)$ comparisons to sort n elements in the worst case
- ii. Any comparison based algorithm must perform $\Omega(n \log n)$ comparisons to sort n elements in the best case

Select one:

- ☐ a. Both of them is true
- ☐ b. None of them is true
- ☐ c. ii only true
- ☒ d. i only true
- ☐ e. None of the above

Feedback

The correct answer is: i only true

Question 13

The space complexity to represent a graph with n vertices and m edges using adjacency matrix is

Select one:

- ☐ a. None of the above
- ☐ b. $O(m+n)$
- ☒ c. $O(n^2)$
- ☐ d. $O(m)$
- ☐ e. $O(n)$

Feedback

The correct answer is: $O(n^2)$

Question 14

Average case running time for quick sort is

Select one:

- ☐ a. $O(n)$
- ☐ b. $O(n^2)$
- ☐ c. None of the above
- ☒ d. $O(n \log n)$

Feedback

The correct answer is: $O(n \log n)$

Question 15

Worst case running time for merge sort is

Select one:

- ☐ a. $O(n)$
- ☐ b. $O(n^2)$
- ☐ c. $O(n \log \log n)$
- ☒ d. $O(n \log n)$
- ☐ e. None of the above

Feedback

The correct answer is: $O(n \log n)$

Question 16

Assume the keys are inserted in the following order. 1055, 1492, 1776, 1812, 1918, 1945.

1812 is stored in the slot _____ if double hashing policy is used with $h_1(k) = 5 * k \bmod 8$ and $h_2(x) = 1 + (k \bmod 7)$.

Select one:

- ☐ a. 7
- ☒ b. None of the above
- ☐ c. 4
- ☐ d. 3
- ☐ e. 1

Feedback

The correct answer is: None of the above

Question 17

Suppose a simple uniform hashing function is used with chaining. The expected number of key comparisons in successful search is at most _____

Select one:

- ☐ a. α

- ☐ b. $1 + \alpha$

- ☒ c. $1 + \alpha/2 - \alpha/2n$

- ☐ d. 1

- ☐ e. None of the above

Feedback

The correct answer is: $1 + \alpha/2 - \alpha/2n$

Question 18

Which of the following statements are true?

- i. In linear probing method, there are only m different probe sequences are possible.

ii. In quadratic probing method, there are m^2 different probe sequences are possible
iii. In double hashing, there are only m different probe sequences are possible.

Select one:

- ☐ a. i only true
☐ b. None of the above
☐ c. All of them are false
☒ d. All of them are true
☐ e. i and ii are true and iii is false

Feedback

The correct answer is: All of them are true

Question 19

1812 is stored in the slot _____ if double hashing policy is used with $h_1(k) = 5 * x \bmod$

8 and $h_2(x) = 1 + (k \bmod 7)$.

Select one:

- ☐ a. 1
☐ b. None of the above
☐ c. 7
☐ d. 4
☒ e. 3

Feedback

The correct answer is: 3

Question 20

Let T be a tree with a maximum degree d . Then the number of leaf vertices is

Select one:

- ☐ a. at most d
☐ b. 1
☐ c. None of the above
☐ d. exactly d
☒ e. at least d


Feedback

The correct answer is: at least d

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