a

What is the major disadvantage of using dynamic data structure?

- a. the overhead to grow it when the structure becomes full
- b. may result in under-estimate of memory usage
- c. need to provide a good estimate of memory usage in advance
- d. may over-estimate memory usage
- e. waste of memory space

e

What is the average cost of insertion in an ArrayList with N items inside?

- a. O(1)
- b. O(NLogN)
- c. O(N*N)
- d. O(LogN)
- e. O(N)

d

Which of the following is not in-place sorting?

- a. selection sort
- b. bubble sort
- c. insertion sort
- d. merge sort
- e. quick sort

a.

In the process of converting "3 + k / t" into postfix expression, how many stack push operations need to be performed?

- a. 2
- b. 0
- c. 1
- d. 3
- e. 5

3.2.4.1 中缀转换为后缀表达式 TRANSFORMING INFIX TO POSTFIX

**转换规则：**

| 中缀表达式中的符号 | 行为 |
| --- | --- |
| 操作数 | 添加到输出后缀表达式的末尾 |
| ^ | 入栈 |
| +、-、*、/ | 如果遇到的符号比栈顶的符号优先级高，入栈；<br>否则，弹出栈顶符号加入到输出后缀表达式末尾，再入栈 |
| 左括号 | 入栈 |
| 右括号 | 把栈顶的操作符弹出，添加到输出后缀表达式末尾，直到遇到与它匹配的左括号为止 |

c.

Which of the following is not correct in Java?

- a. Interfaces can extend other interfaces
- b. Classes can extend other classes
- c. Java can have "type parameter"
- d. Classes can implement interfaces
- e. Abstract classes can extend other classes

Clear my choice

e

Which of the following data structures does not allow duplicates?

- a. Tree
- b. queue
- c. bag
- d. list
- e. set

b ?

Which of the following is not correct in Java?

- a. An Iterator interface must define a remove() method.
- b. A Comparator interface must define a compareTo() method.
- c. An Iterator interface must define a next() method.
- d. A Scanner() is an iterator
- e. An Iterable class must implement inside it an iterator.

Clear my choice

d

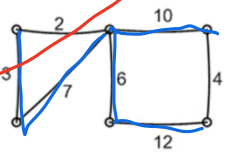
Data insertion in a linked list is achieved by?

- a. changing of elements
- b. None of the others are true
- c. changing of stacks
- d. changing of links
- e. changing of indices

- Traverse the list by following the links
- Insert by changing links
- Remove by changing links

b.

Derive a **maximum** spanning tree (MST) for the following graph. What is the total cost for the MST derived?




3+7+6+10+12
= 38

- a. 25
- b. 38
- c. 21
- d. 32
- e. 15

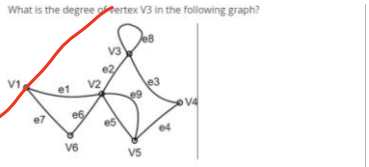
d

Which of the following is not a linear data structure?

- a. list
- b. priority queue
- c. queue
- d. tree
- e. stack

d

What is the degree of vertex V3 in the following graph?




- a. 3
- b. 1
- c. 0
- d. 4
- e. 2

a

Which of the following data structures is not ordered?

- a. map
- b. stack
- c. queue
- d. array
- e. list

b

If a hash table is well designed with few collisions, what is the average cost of each hash table lookup?

- a. $O(N^3)$
- b. O(1)
- c. None of the others are true
- d. $O(N^2)$
- e. O(N)

d

What is the average performance of searching an item within a non-sorted array with N items inside?

- a. O(N*N)
- b. O(1)
- c. O(LogN)
- d. O(N)
- e. O(NLogN)

a

Which of the following operations does not belong to the stack interface?

- a. min
- b. pop
- c. push
- d. new
- e. top

a

What is returned from hasNext() when the queue is empty?

- a. a boolean value FALSE
- b. None of the others are true
- c. the null value
- d. an exception
- e. a boolean value TRUE

c

Assume a reasonable and efficient unordered ArraySet implementation, which of the following does not have the same cost as the others?

- a. all the others have the same cost
- b. add
- c. isEmpty
- d. contains
- e. remove

a

Which of the following specifies the number of vertices in a graph G?

- a. order of G
- b. map of G
- c. hash of G
- d. index of G
- e. incidence of G

c

Which of the following operations does not exist under a map data structure?

- a. get
- b. size
- c. set
- d. remove
- e. put

a

Which of the following operations is used for rebalancing an AVL tree?

- a. rotation
- b. none of the others are correct
- c. mirroring
- d. pruning
- e. shifting

b

What is the average performance of searching an item within an AVL tree with M items inside?

- a. O(1)
- b. O(LogM)
- c. O(N*N)
- d. O(MLogM)
- e. O(N)

a

What is the worst case performance for deletion of one value in an AVL tree with N nodes?

- a. O(log N)
- b. O(1)
- c. O(N log N)
- d. $O(N^2)$
- e. O(N)

d

b.

Using abstraction and encapsulation in designing programs, which of the following is not necessarily an outcome?

- a. modular programs
- b. shorter code
- c. program easier to change
- d. localisation of errors
- e. elimination of side effects

e

Which of the following is not correct?

- a. items in a set may not be duplicated
- b. items in a bag may be duplicated
- c. items in a sorted list may be duplicated
- d. items in a linked list may be duplicated
- e. items in a priority queue may not be ordered

C

Which of the following is related to the "information hiding" design principle?

- a. decoding
- b. dynamic data type
- c. privacy
- d. watermarking
- e. encoding

e

What is the best language to study data structures?

- a. C
- b. Assembly
- c. Java
- d. C++
- e. None of the others are true. Language is not an issue.

Clear my choice

a.

Which of the following is TRUE for hash table design?

- a. Table size is usually prime to avoid bias ✓
- b. A hash function is needed to generate random numbers
- c. Information hiding is used to hide keys
- d. None of the others
- e. Huffman coding is applied in the design