1- Select correct statement about Run-length encoding.

Answer: A serious drawback of run-length encoding

2. ... will visit nodes of a tree starting from the highest (or lowest) level an d moving down (or up) level by level and at a level, it visits nodes from left t o right(or from right to left).

Answer: Breath-First Traversal

Select correct statement.

Answer: The keyword implements is used to specify that a class inherits from an interface.

The operation for adding an entry to a stack is traditionally called:

Answer: push

2. Which of the following keywords are access modifier:

Answer: Protected, Private

Select correct statements:

Answer:- Subclasses or derived classes inherit the fields... , An abstract data type can be part of a program in the form of an interface.

4. Which of the following statements are true:

Answer:- AN object can be saved in a life if its class type is stated, If the v ector s capacity is greater than its size, then a new elem

5. Which of sentences about singly linked list are true:

Answer:- Deleting a node at the beginning of th ...time O(1) - On the average, delete operatio... O(n) steps, There is no immediate access to the predecessor of any node in list

6. Select correct statement(s) about Doubly Linked List:

Answer: - The node which is deleted from the list will ... e garbage collection , Deleting a node at the end of...ant time O(1), Processing for adding a node to the end of list includes six steps

8. Select incorrect statement about skip list:

Answer:- The search time is O(lgn) in the worst case , In 20-element skip lists , the node in position 3 points to the

9. Select false statement:

Answer: - In the array list, poping is executed in O(lgn) to the worst case

10. Select true statements about stack:

Answer: - The Java implementation of the stack is potenti, Stack can be impleme nted by linked list

11. Which of the following methods of queue are true:

Answer: isEmpty() Check empty, enqueue(el) Put at the end of the, firstEl() urn the first without removing it

12. Which of the following can be executed in constant time O(n)

Answer: - When deleting a node of a singly linked list in the average case , i n the worst case

13. Which of the following statements are true:

Answer: - The recursive version increases program readability, improves self-do cumentation and simplifies coding

14. When converting a method from a recursive version into an iterative version

Answer: The brevity of program formulation lost. However, the brevity may not be an issue in Java , Program clarity can be diminished

15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system.

Answer: True

16. In all cases, nonrecursive implementation is faster recursive implementation .

Answer: False

17. Which of the following concepts of tree are true:

Answer: The height of a nonempty tree is the maximum level of node ,The level of a node is the length of the path from the root to the node plus 1,The level of a node must be between 1 and height of the tree

18. Select correct statement:

Answer: For a binary tree with n nodes, there are n! different traversals, The c omplexity of searching depends on the shape of the tree and the,Breath-First traversal

Select incorrect statement

Answer:Depth-first traversal can not be implemented if ,A recursive implementati on of preorder tree trav,There are six possible ordered depth-first travel

20. Which of the following statements are true:

Answer:Polish notation eliminates all parentheses from formu, Using Polish notat ion, all expressions have to be brok,Expression trees do not use

21. Which of the following sentences are true:

Answer: The complexity of DFS is O(|V| + |E|), where |V| is number of ve, To pre vent loop from happen in an algorithm for traversing a gra

22. Which of the following statements about finding the shortest path are true:

Answer:For label-correcting method, information of any ,The complexity of Dijkst ra s algorithm is O(|V|2) ,The complexity of Ford s algorithm is O(|V||E|) fo

23. Which of the following statement about spanning tree is false:

Answer: None of the others

24. Which of the following statements about graph coloring is true:

Answer: The complexity of sequential Coloring algorithm is O(|V|2) ,Sequential C oloring algorithm establishes the sequence of

25. Which of the following statements about efficient sorting is false:

Answer:Shell sort divides the original array into physical subarrays, s

26. Which of the following statements about efficient sorting is false:

Answer:The worst case is when the bound divides an array ,The best case of quick sort happens when bound is

27. Which of the following statements is true:

Answer: All of the others: +

All the sorting methods implemen In Insertion Sort, the number of movements and comparison for a randomly ordere d array is closer to the best case.

Answer: False

Which of the following statement about Open Addressing are false:

Answer: In linear probing of the open addressing method, the position in which k ey,Using quadratic probing gives much better results than line

30. Which of the following statement are true:

Answer: Linked list can be used in Bucket Addressing,Self-organizing linked list s can be used impro,Coalesced hashing combines linear probing

31. Which of the following statement about Perfect Hash Functions are true:

Answer: Cichellis method uses an exhaustive search ,Cichelli s method is used to ha sh relatively sma

32. Select correct statements:

Answer: A reorganization of the file is avoided by using extendible hashing, The characteristic feature of extendible hashing is the organizatio

33. Which of the following data structure can be implemented Huffman Coding

Answer: Singly linked list, Priority queue, Doubly linked list

34. Select incorrect statements about Huffman Coding:

Answer: Huffman tree is only implemented by non-recursive. David Huffman s algorit hm may not be useful for se, Adaptive Huffman coding uses breath-first left-to-r ig

35. Select correct statement about Run-length encoding.

Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs

36. Identify whether below code has error or not: Abstract class AC1{

Answer: - Compile error 37.

Identify whether below code has error or not: Interface I2{

Answer: - 3 compile errors ExtC object1 = new ExtC(); C object2 = new ExtC(), object3 = new ExtC();

Which of the following statements are true

Answer: Object1.process2( N ) calls process2 of class Ext, Object2.process1(1) does not issue compile erro, Object2.process3( N ) call process3 of class C  
  
Data[j] = data[j-1]; Data[j] = tmp; }

Identify which algorithm the above code implements

Answer:- Insertion Sort If (data[j].compareTo(data[j-1])<0) Swap(data,j,j-1); }

Identify which algorithm the above code implements

Answer: - Bubble sort System.out.print(i+ Nontail(i+1); );  
  
} } What is output if nontail is called with i=3

Answer: - Runtime error is issued. Nontail(i-2); } }

What is output if nontail is called with i=5

Answer: 1315131 preorderVRL(p.left); } }

What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image:

Answer: 2 6 3 15 8 10 1 11 12

What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image:

Answer: 2 6 8 3 15 10 1 11 12

Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed

Answer: {2,4,5,8,9,10,3}

Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for lo

Answer: - {19,18,14,6,5,10,15}

Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not:

Answer:There may be runtime error in some case dentify whether the code of pop method has error or not:

Answer: There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled.

What output if reverse is executed and input string is ABCDEF\n

Answer: - \nFEDCBA

51. Which of the following about queue are true

Answer: A queue is an FIFO structure

52. Which of the following statement of queue are true

Answer: All of the others: + Using array for queue implemen

53. Select false statement:

Answer: In the array list, poping is executed in time O(n) to the worst case

54. In the doubly linked list implementation, enqueuing can be executed in time O(n)

Answer: False

55. Which of the following statements about heap are

false: Answer:Heaps represented by array can be travered easily in, A heap can be defin  
  
ed as an array heap of length n in, Heaps can be implemented by arrays

56. Consider below recursive define about tree:

Answer: An empty structure is an empty tree

57. Which of the following statements about elementary sorting is true:

Answer: None of the others + In selection sort, for every iteration j of,+ The w orst case of selection sort has n-1

58. Which of the following statements about efficient sorting is true:

Answer: Insertion sort is applied to small portions of an array, Mergesort can b e made more efficient by replacing

59. Select correct statements about Radix sort:

Answer: bitRadixsort() can be improved by implementing array , One of techniques radix sort uses is by looking at each

60. Which of the following statement is true:

Answer: If hash function transforms different keys into different numbers, it is called a perfect hash function

61. Select correct statements:

Answer: In shift folding method, the key is usually divided into even, The bound ary folding method is applied to number data

62. Which of the following statements are false:

Answer: The best value of divisor can be any,

The folding method is the preferre d choice for t Each codeword corresponds to one or more symbols

Answer: False

Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique

Answer: True

65. Select correct statement about Ziv-Lempel Code

Answer: All of the others: + Ziv-Lempel Code uses buffer + The codeword of Ziv-L empel

The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol m; that is

Answer: False

67. In the array implementation, enqueuing can be executed in constant time O(1)

Answer: True

68. Which of the following about stack are true:

Answer: The most top element is the latest added element , Operations of stack b ased on Last in First out structure.

69. In the array implementation, dequeuing can be executed in O(n)

Answer: False

71. Select incorrect statement:

Answer: The anchor or ground case allows for the construction of new objects out of basic e

What is the value of h(1):

Answer: 14

What is the value of A(3,1):

Answer:

15 In all binary trees, there are 2i nodes at level i.

Answer: False

75. Which of the following methods are used to traverse a tree without using any stack or threads:

Answer: Traversal through tree Transformation

76. Which operation is used in DSW Algorithm:

Answer: Rotation

77. Which of the following are false:

Answer: A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) ,A circui t is a cycle in which all vertices must be different

78. Which graph representation is best?

Answer: It depends on the problem

79. Which of the following statements about finding shortest path are true:  
  
Answer: For label-setting methods, in each pass through the vertices still, The methods solving the shortest path problem are divided into

80. Which of the following statements about graph coloring is true:

Answer: Sequential coloring algorithm establishes the sequence of vertices, The complexity of sequential Coloring algorithm is O(|V|2)

81. Which of the following statement about finding the shortest path is false:

Answer: - The complexity of WFI s algorithm is |V|3 that is good efficiency for a ny graph

82. In insertion sort algorithm, the number of times variables tmp is loaded and unloaded in the outer for loop is not:

Answer: All of the others: + Necessary in the worst case + Redundant in the best case

83. Which of the following statements about Quick sort is true:

Answer: Quick sort is recursive in nature A strategy for selecting a bound is to choose the element located in the middle of the array

84. Skip list helps avoiding sequential search

Answer: True

85. Select correct statement(s):

Answer:A singly linked list is a node that has a link only to its successor , serting a new node at the end of the singly linked list without ta

86. Which of the following operations are implemented in the LinkedList class longs to the java.util package:

Answer: All of the others: + Return the copy of the linked list without + Add l the elements from one collection Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are naged by the heads and tails.

The complexity of direct concatenating L2 to L1  
  
In be al ma is  
  
Answer: O(1) 88.

Which of the following operations are not implemented in the ArrayList class belongs to the java.util package:

Answer: None of the others: + Remove the object at given position + Copy all obj ects from the array list to

89. Elements of a linked list must be consecutive memory cells

Answer: False

90. If an algorithm is constantly accessing only some elements such as the first , the second, the last and the like, an if changing the structure is very import ant to the algorithm then solution is using:

Answer: Linked list

91. The advantages of array over linked lists is that they allow random accessin g

Answer: True

92. Which of the following operations are implemented in the ArrayList class bel ongs to the java.util package:

Answer:All of the others: + Update one element in any+ Add one element to any po + Retrieve one element from

93. Linked lists allow easy insertion and deletion of information because such o perations have a

Answer: True

94. In the doubly linked list implementation, dequeuing can be executed in const ant time O(1)

Answer: True

95. Which of the following methods of queue are true:

Answer: Enqueue(el) Put the element el at, Dequeue() Take the first element

Consider the following recursive function, assuming n is even: What is the valu e of h(20):

Answer: 11 97.

Which of the following statements are false:

Answer: An activation record still exists after a method, An activation record c ontains code of method  
  
99. Most of the label-setting and label-correcting are used to find the shortest paths from one vertex to all other vertices

Answer: False

Which of the following statements about Perfect Hash Functions are true:

Answer: In a minimal perfect hash function, wasting time for collision resolu, The functioning in HCD algorithm is found in three steps: mapping,

Hash function is function that can transform a particular key (K) (a string, number or record) into an index the table used for storing items of the same type as K.

Answer: True

Entropy of source M is defined by:

Answer: False

Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package:

Answer: Return the sub list of the array list containing copy of elements in the array list

Insertion sort which case is only one comparison made for each position i: Answer: - The data are already in order

What are number of additions and number of calls to find Fib(8) using recursive definition

Answer: 33 and 67

Which of the following statements about Quick sort is true:

Answer: A strategy for selecting a bound is to choose the element , Quick sort is recursive in nature.

107. Which of the following statements about elementary sorting is true

Answer: Advantage of using insertion sort that it sorts the array only when is really necessary

Select correct statements:

Answer: The middle part of the bit representation of the square of a key is,

In practice, the mid-square method is more efficient to the size of \_class $value$ zer@ Angs\_trom

Answer: zer@

Which statement concerning the switch construct is true? All switch statements must have a default label. A character literal can be used as a value for a case label The keyword continue can never occur within the body of a switch statement. All of the others.

Answer: A character literal can be used as a value for a case label

If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73?

Answer: new Integer(str)).intValue()

Select correct statements about a singly linked list. Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list. All of the others None of the others.

Answer: A node with a specified value (info) can be found by traversing the list .

Advantages which linked list have over an array:

Answer: Size can be expanded and shrunk rapidly.

Which of the following methods take O(n) time for the worst case:  
Answer: All of the others.

Select correct statements about a singly linked list. A new node can be inserted into any position, except first position, without any traversal. Deleting a node at the beginning of a list involves setting head to point to head.next. All of the others. None of the others.

Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next.

Properties of a stack is:

Answer: Only one item can be accessed at once.

Properties of a queue are:

Answer: Only one item can be accessed at once.

In the array version of the Stack class, which operations require linear time for their worst-case behavior?

Answer: None of these operations require linear time.

In the linked-list version of the Stack class, which operations require linear time for their worst-case behavior? Assume that addtoTail, deletefromTail are used.

Answer: pop

Select wrong statements: Recursion is always more efficient than loops. Recursion can make the conceptual design of an algorithm s implementation easier. Recursion gone wrong can lead to overflow stack errors Recursion can be only replaced by iteration.

Answer: is always more efficient than loops+ can be only replaced by iteration

In a single method declaration, what is the maximum number of statements that may be recursive calls?

Answer: There is no fixed maximum

The problem of printing an input line in reverse order can be implemented using: Answer: Recursion

Consider algorithm of the 8-queen problem:

Answer: The algorithm finds all solutions.

On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes?

Answer: 20

To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node?

Answer: The rightmost node of the left subtree of the deleted node.

Tree balancing can be performed locally after an element is inserted into or deleted from the tree using .

Answer: AVL tree.

The DSW Algorithm uses:

Answer: Right + Left rotation.  
  
The depth-first search algorithm for a graph:

Answer: Travels all possible paths from a vertex to see if it can find the destination before it moves on to the adjacent vertices.

Select right statements: Djikstra's shortest path algorithm can be applied to undirected graph. The breadth-first search can be used to find the shortest path from a source ver tex to the destination vertex All of the others. None of the others.

Answer: All of the others.

Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method?

Answer: Kruskal + Dijkstra algorithm.

Which of the following statements about shortest path finding algorithms are true: Dijkstra s algorithm is label-setting algorithm. Dijkstra s algorithm can be applied to graphs have negative weights. The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertices of graph. All of the others.

Answer: Dijkstra s algorithm is label-setting algorithm.

When is Insertionsort a good choice for sorting an array?

Answer: The array has only a few items out of place.

Mergesort makes two recursive calls. Which statement is true after these recursive calls finish, but before the merge step?

Answer: Elements in each half of the array are sorted amongst themselves.

Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct?

Answer: The algorithm is not selectionsort, but it might be insertionsort.

In Quicksort, the bound value (pivot) is:

Answer: All of the others.

The more complex the hashing functions, the better it is

Answer: False

Which of the following methods are used to collision resolution:

Answer: Open addressing.

Which of the following hashing methods can cause collision:

Answer: All of the others.

Select incorrect statements:

Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on.

Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100  
Z: 110 Which of the following restrictions does this encoding violate:

Answer: No codeword is a prefix of another codeword.

Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others

Answer: Huffman algorithm can be only applied to text files.

The Huffman algorithm always produces a unique binary tree.

Answer: False

In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords.

Answer: True

Select incorrect statements about Data compression: a Huffman tree can be only constructed bottom-up. b In adaptive Huffman encoding, sibling property is retained assures the H uffman tree under construction is still a Huffman tree. c All of the others. d None of the others.

Answer: Huffman tree can be only constructed bottom-up.

Which expressions will evaluate to true if preceded by the following code? (a == "Hello") (a == b) (a == c) a.equals(b)

Answer: (a == c)+a.equals(b)

What is output when calling TriangularNumber(4)

Answer: 10

What is maximum number of activation records (including its caller) in runtime stack when calling TriangularNumber(10)

Answer: 11

What is maximum number of activation records (including its caller) in runtime stack when traversing the below tree using the above algorithm?

Answer: 5

What is maximum number of elements in queue when traversing the below tree using the above algorithm?

Answer: 4

Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop.

Answer: {15,12,6,11,10,2,3,1,8}

In the first loop, moveDown is called n/2 times in any case. The total number of moves in all executions of moveDown in the second phase is O (lgn). All of the others. None of the others.

Answer: In the first loop, moveDown is called n/2 times in any case.  
  
this is g of A this is g of C An error occurs when compiling the program. Nothing is printed. Answer: this is g of C

Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop.

Answer: {3,4,8,10,12,17,5,14,13}

How many times is number 840 printed out when call pattern(840)

Answer: 2

How many integers will the program print when calling nonTail(n), n > 0.

Answer: 2^n -1

Count number of even values in binary tree. Print even numbers in binary tree. Print even numbers in ascending order. Print and count number of even values in binary tree.

Answer: Print even numbers in binary tree.

Count number of nodes in binary tree. Calculate height of binary tree. Count number of nonterminal nodes in binary tree. None of the others

Answer: Calculate height of binary tree.

Check whether binary tree is balanced. Check whether height of left subtree is greater than height of right subtree. Check whether height of right subtree is greater than height of left subtree. None of the others.

Answer: Check whether binary tree is balanced.  
  
Select incorrect statements about Object Oriented Programming: Static methods and variables are associated with the class it self and are called instance methods and instance variables The combination of data and related operations is called information hiding principle.

Answer: Static methods and variables+ The combination of data

Which of the following keywords are access modifier:

Answer: protected + private

Select correct statements: a. A derived class can override the definition of a final method by introducing its own definition t. In an abstract class, methods are only declared but not defined c. Subclasses or derived classes inherit the fields and methods from their base class. d. An abstract data type can be part of a program in the form of an interface

Answer: Subclasses or derived classes inherit+ An abstract data type

An object can be saved in a file if its class type is stated to implement the Serializable interface, d. If the vector s capacity is greater than its size, then anew element can be inserted at the end of the vector immediately.  
Answer: An object + If the vector s capacity

Which of sentences about singly linked list are true:

Answer: begin O(1)+ average O(n)+ is no immediate

a. Methods for processing doubly linked list are simpler than those of singly linked list b. The node which is deleted from the list will be claimed by the garbage collector. c Deleting a node at the end of the list takes constant time 0(1). d. Inserting a new node at the end of the list requires 0 ( n) steps.

Answer: The node which is deleted+ Deleting a node at the end

Select incorrect statement about skip list:

Answer: None of the others.

Select incorrect statement about skip list: The search time is O (ign) in the worst case.

Answer: search time is O (ign)+20 element

Select false statement: Stack can be implemented using linked list. Stack is applied to Java Virtual Machine, In the array list, poping is executed in O (lgn) to the worst case. In the array list, popping is executed in constant time 0(1)

Answer: poping is executed in O (lgn) to the worst case.

a. The Java implementation of the stack is potentially fatal. b. pop () method returns copy of the top element in the stack c. peek () method removes the top element of the stack and return it. d. Stack can be implemented by linked list.

Answer: The Java implementation+ Stack can be implemented by linked list

Which of the following can be executed in constant time 0 ( n)

Answer: deleting singly linked list average case +worst case.

Which of the following statements are true: Local variables must be stored in activation recordt. the return address is address of the callers instruction immediately foilowing the cal 1.

Answer: all-in the most case

When converting a method from a recursive version into an iterative version, Answer: The brevity not be lost + diminished

Recursive definitions on most computers are eventually implemented using a run t ime stack and this implementation is done by the operating system.

Answer: True

In all cases, nonrecursive implementation is faster recursive implementation. Answer: False

Which of the following concepts of tree are true:

Answer: all -path is number of arcs

Select correct statement: A search can takes 1g ( n) time units in the worst case. Answer: all-A search lg ( n)worst case.+ for a binary tree  
  
Select incorrect statement: Depth-first traversal can be implemented using stack. Depth-first traversal can not be implemented if not using stack A recursive implementation of preorder free traversal uses stack p1icitly. There are six possible ordered depth-first traversals. Morris s algorithm does not temporarily change free structure.

Answer: all-DF stack+ morris

Which of the following statements are true: a. Polish notation eliminates all parentheses from formulas b. Preorder, inorder and posorder tree traversal generate unambiguous outputs. Using Polish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order d. In a expression tree, leaves are operators and nonterninal nodes are operands. e. Expression trees do not use parentheses. f. Polish notation is only applied for compilers.

Answer: parentheses +Using Polish+ Expression

Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithmis O(VWEh for any graph. t. For label-correcting method, information of any label can be changed during application of method. c. Ford s algorithm relies on label -setting method. t The complexity of Dijkstra s algorithm using heap is O(VlnV) e. The complexity of Dijkstra s algorithm is o( v12)

Answer: complexity Dijkstra s +complexity Dijkstra s + label-correcting

Which of the following statement about spanning tree is false: a. The complexity of Kruskal s algorithm depends on the complexity of the sorting method applied t. The complexity of Kruskal s algorithm depends on the method used for cycle detection. c. All of the others. t None of the others.

Answer: None of the others.

Which of the following statements about efficient sorting is false: a. The worst case is when the bound divides an array into subarrays of approximately length b. In quick sort, a strategy for selecting a bound is to choose the element located in the middle of the array. c The best case of quick sort happens when bound is the largest (the smallest) element of the array. d. Quick sort is recursive in nature.

Answer: n/2 + best case

Which of the following statements is true; a. All the sorting methods implemented in java is applied to any basic data type. t. For objects comparison, a comparison criterion must be implemented by user for all classes. c All of others. t None of others.

Answer: All of others.  
  
In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. Answer: false Which of the following statement are true: Linked list can be used in Bucket Addressing. In chaining, searches always fast if using linked lists. Answer: All-in chaining correct statements a. Extendible hashing is directoryless technique t. Extendible hashing is faster than and requires less space than Linear hashing. c. A reorganization of the file is avoided by using extendible hashing if the directory overflows. The characteristic feature of extendible hashing is the organization of the index, which is expandable table. e. Linear hashing is directory technique. Answer: reorganization + characteristic incorrect statements about Huffman Coding Answer: all-Huffman tree can be built top-down. correct statements about Run-length encoding. Answer: A serious drawback of run-length encoding is that it reliesentirely on the occurrences of runs Identify whether below code has error or not: Answer: Compile error. Identify whether below code has error or not: Answer: 3 Compile error. objectiprocess2 ( N ) calls process2 of class ExtC. object2.processl (1) does not issue compile error. object2.process3 ( N ) call process3 of class C. object3.process2( N ) call process2 of class C. Answer: all-object3.process2( N ) call process2 of class C. Identify which alogrithm the above code implements Insertion Sort Bubble Sort Selection Sort Radix Sort Answer: Insertion Sort Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is ABCDEF\n Answer: FEDCBA What is output if nontail is called with j = 3 Runtime error is issued 1213121 12321 21312 Answer: Runtime error is issued What is output if nontail is called with i = 5 1315131  
  
13531 3135313 None of the others Answer: 1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: 1211181021563 28 112 11106153 2631581011112 12 1111082 1536 Answer: 2631581011112 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 1211181021563 28 112 11106153 263 15 81011112 121111082 1536 Answer: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 2863 15 10112 11 286110153 12 11 268 110 153 1112 2683 15 10 11112 Answer: 2683 15 10 11112 Assume that sort is executed with array {9,4,2,5,8,15,3}. What is output after iteration i=5 of the outer for loop completed Answer: {2,4,5,8,9,10,3) Assume that sort is executed with array {19,14,6,5,18,1,15}. What is output afte r iteration i=5 of the outer for loop completed Answer: { 19, 18, 14,6,5,10, 15) Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: There are some compile errors. There may be runtime error in some case. There always are runtime errors. No error. Answer: There may be runtime error in some case. Identify whether the code of pop method has error or not: Answer: There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string Â¡s ABCDEF\n t Answer: \nFEDCBA Skip list helps avoiding sequential search answer: true A tree structure is not linked structure answer: a singly lnked list + inserting a new model  
  
Which of the following operations are implemented in the linkedlist class belong s to the java.util package answer: all of the others Which of the following operations are implemented in the Arraylist class belongs to the java.util package answer: none of the others Let L1 (having n nodes) and L2 (having m nodes) be two linked lists which are ma naged by the heads and tails answer: o(1) In the array implementation, enqueuing can be executed in constant time o(1) answer: true Select true statement about stack: answer: The Java implementation of the stack+ stack can be implemented by linked list Which of the following about stack are true answer: the most top element + Operations of stack based In the array implementation, dequeuing can be executed in o(n) answer: false Which of the following about queue are true: answer: A queue is an FIFO structure In the doubly linked list implementation, dequeuing ca be excuted in constant ti me o(1) answer: true In the doubly linked list implementation, enqueuing ca be excuted in o(n) answer: false Which of the following methods of queue are true answer: enqueue + dequeue(first) + isempty + firstel Select true statements about stack answer: Stack can be implemented by linked list + the java implementation of the stack is potentially fatal Which of the following statement about queue are true answer: all of the other Select false statement answer: in the array list, poping is excuted in time o(n)to the worst case Select correct statement about Doubly Linked List answer: Deleting a node at the end of the list takes constant time o(1)+ process ing for adding a node The advantage of arrays over linked lists is that they allow random accessing answer: true Inserting a new node at the end of the singly linked list answer: a singly linked list is a node + A linked list is a collection of nodes Which of the following operations are not implemented in the Arraylist class bel ongs to the java.util package answer: return the sub list of the array list Which of sentences about singly linked list are true: answer: There is no immediate access to the predecesor+ on the average+ deleting a node at the beginning of the list Select incorrect statements about object- oriented programming: answer: the combination of the data+ satic methods and variables x=7; y=4\*++x; z=5\*x--; what the values of x,y,z answer: x=7, y= 32, z= 40 characters are 16 bits long answer: characters are 16 bits long+ for a postfix+ Character that constitute va riable Seclect false statement about Java: answer: Java is not case sensitive Which of the follwing statements are invalid answer: int c= {1,2,3,4,5}int []b= int[4]int e[5] Java allows multi inheritance answer: if the vector's capacity is greater than its size + a vector is a data s  
  
tructure Dynamic binding determines the type of response at compilation time answer: polymorphism is implemented through static + the data structures field i s designed A condition in if clause can be any value answer: A condition in if clause can be any value + for a prefix operator + the program continuws with a statement In an abstract class, method answer:In an abstract class, method+subclasses or derived classes+an abstract da ta type Java uses four access modifiers answer: a package is a collection of classes + Java uses four access modifiers When converting a method from a recursive version into an iterative version answer: the brevity of program formulation lost+ program clarity can be diminish ed Consider the following recursive function, asuming n is even answer: 11 Recursive definitions serve generating new elements and testing whether an eleme nt belongs to a set answer: the anchor or ground case allows for the construction of new object In all cases, nonrecursive implementation is faster recursive implementation answer: false The data area containing state information of one method is called an activation record answer: an activation record still exists + an activation record contains code o f method What is the value of h(1) answer: 14 What is the value of A(3,1) answer: 13 What are number of additions and number of calls to find Fib(8) answer: 34 and 67 Recursive definitions on most computers are eventually implemented using a run-t ime stack answer: true Global variables must be stored in activation record answer: the recursive version increases program readability+ the return address is address Consider below recursive define about tree answer: true Which of the following methods are used for Depth-First Traversal answer: all of the other Expreesion trees do not use parenthese answer: Polish notation eliminates all parenthese from formulas+ Using polish no tation, all expressions have to be...+ Expression trees do not use parenthese In all binary trees, there are 2 nodes at level i answer: false Which of the following concepts of tree are true answer: The height of a nonempty tree is the maximum+ the level of is the length of the path from+ the level of node There are six possible ordered depth-first traversals answer: Morris's algotrthm does not temporarily change tree structure+ a recursi ve implementation + depth first traversal can not be Which of the following statements about heap are false answer: heap represented by array+ a heap can be defineed as an array+ heaps can be implemented by array Which of the following methods are used to traverse a tree without using any sta ck or threads answer: traversal through tree transformation Which operation is used in DSW algorithm  
  
answer: rotation A pseudograph is multigraph which allows for loops to occur answer: a path from v1 to vn + a circuit is a cycle Which graph representation is best answer: it depends on the problem Which of the following statements about finding the shortest path are true answer: For label-setting methods, in each pass through+ the methods solving the shortest path problem are Which of the following statements about graph coloring is true answer: sequential coloring algorithm + the comlexity of sequential Which of the following statements about finding shortest path is false answer: the complexity of WFI's algorithm is V3 The chromatic number of the cycle answer: the choromatic number of the complete+ in Brelaz's algorithm Most of the label-setting and label- correcting methods are used to find the sho rtest paths from one vertex answer: true Which of the following statements about elementary sorting is true answer: none of the other Which of the following statements about efficient sorting is true answer: Insertion sort is applied+ Mergesort can be made more In insertion sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case answer: false Which of the following statements about efficent sorting is true answer: all of the other Select correct statements about Radix sort answer: bitradixsort() can be improved + One of techniques radix sort In insertion sort algorithm, the number of times variable tmp answer: all of the other Which of the following statements about quick sort is true answer: quick sort is recursive in nature + a strategy for selecting a bound is to choose Mergesort don't consume much memory answer: Mergesort can be made more efficient + Insertion sort is applied to smal l portions To create a hash function, the table has to contain at least the same number of positions answer: if hash function transforms different keys into different numbers Which of the following statements about open addressing are false answer: using quadratic probing gives much better results than linear probing an d avoids the problem+ in linear probing of the open Linear hashing is directory technique answer: the characteristic feature of extendiable+ a reorganization of the file Linked list can be used in bucket addressing answer: coalesced hashing combines linear probing with chaning+ linked list can be used The mid-square method is applied only to number data answer: the middle part of the bit representation of the square of a key + in pr actice, the mid-square The shift folding method is applied to string data answer: in shift folding method+ the boundary folding method The best value of divisor can be any answer: The best value of divisor can be any+ the folding method is the preferre d choice Which of the following statements about perfect hash functions are true answer: in a minimal perfect hash function+ the function g in FHCD Hash function is function that can transform a particular key answer: true Each codeword corresponds to one or more symbols  
  
answer: false Run- lenght encoding is very efficient for text file in which only blank charact er answer: true Select correct statement about Ziv-Lempel code answer: all of the others Select correct statement about run-length encoding answer: A serious drawback of run length encoding The length of the codeword for a given symbol mj shoukd not less than the length answer: false Select incorrect statements about huffman coding answer: huffman tree is only implemented+ adaptive huffman coding uses breath-fi rst 1. Select incorrect statements about Object - Oriented Programming answer: [static methods and variables are...][The combination of data and...] 2. Which of the following keywords are access modifier: answer: [protected][private] 3. Select correct statements answer: [Subclasses or derived classes inherit...][An abstract data type can be part of a...] 4. Which of following statements are true answer: [an object can be saved in a file if..][If the vector's capacity is grea ter than its size,..] 5. Which of sentences about singly linked list are true: answer: [Deleting a node at the beginning...O(1)][On the average,...O(n)step][th ere is no immediate..] 6. Select correct statement(s) about Doubly Linked List answer: [The node which is deleted...garbage collector][Deleting a node at the e nd...O(1)] 7. Select incorrect statement about skip list answer: None 8. Select incorrect statement about skip list answer: [The search time is O(lgn)...worst case][In 20-element skip list...3poin ts...position 7] 9. Select false statement answer: In the array list, poping is executed in O(lgn) to the worst case 10. Select true statements about stack answer: [The Java implementation .... fatal][Stack can be implemented by linked list] 11. Which of the following methods of queue are true answer: [isEmpty() - Check to see...][enqueue(el)-put the element..][firstEl() Return the first..] 12. Which of the following can be executed in constant time O (n) answer: [when deleting a node...average case][when deleting a node...worst case] 13. Which of the following statements are true answer: [Local variables...activation record][The return address...following the call][The recursive ver...] 14. When converting a method from a recursive version into an iterative version answer: [The brevity of program formulation lost... may not be.. Java][Program c larity can be diminished] 15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system. answer: true 16. In all cases, nonrecursive implementation is faster recursive implementation answer: false 17. Which of the following concepts of tree are true answer: [The height of nonempty tree is the max...][The level of a node is the l ength ...root..node plus 1][The level of a node must be ...1 and height..] 18. Select correct statement answer:[The complexity of searching a node...][The complexity of searching depen  
  
ds...][Breath-First ...using queue] 19. Select incorrect statement answer: [Depth-first traversal can not be ... if not using track][A recursive im plementation preorder...uses stack...][There are six possible ordered...] 20. Which of the following statements are true answer: [Polish notation eliminates all ...][Using Polish notation,...broken dow n....proper oder][Expresstion trees do not use pare...] 21. Which of the following sentences are true answer: [The complexity of DFS is O(|V|+|E|)...][To prevent loop from happen in an ... can be marked] 22. Which of the following statements about finding the shortest path are true anwer: [For label-correcting method, ....][The complexity of Dijkstra's....is O( |V|ln|V|)][The complexity of Dijkstra's....is O(|V|^2)] 23. Which of the following statement about spanning tree is false answer: None 24. Which of the following statements about graph coloring is true answer: [The complexity of sequential .... O(|V|^2)][Sequential Coloring establi shes ....before coloring them] 25. Which of the following statements about efficient sorting is false answer: [Shell sort divides the original array into physical .... array is sorte d][Only inscrtion sort is appllied ...] 26. Which of the following statements about efficient sorting is false answer: [The worst case is when the bound divides... length n/2][The best case o f quick sort happens... element of the array] 27. Which of the statement is true answer: [All the sorting methods implemented...basic data type][For objects comp arison...by user for all classes] 28. In Insertion Sort, the number of movements and comparisions for a randomly o rdered array is closer to the best case answer: false 29. Which of the following statement about Open Addressing are false answer: [For quadratic probing, the size of table should not be ...][Using quadr atic probing gives much better....linear and avoids ... cluster buildup] 30. Which of the following statement are true answer: [Linked list can be used in Bucket Addressing][Self-organizing linked li st ...improve performance in chaining][Coalesced hasing combines linear probing with chaning] 31. Which of the following statement about Perfect Hash are true answer: [Cichelli's method uses an exhaustive search][Cichelli's method is used to hash relatively small number...] 32. Select correct statements answer: [A reorganization of the file is avoided ... overflows][The characterist ic feature of extendible hashing... expandable table] 33. Which of the following data structure can be implement Huffman Coding answer: [Singly linked list][Priority queue][Doubly linked list] 34. Select incorrect statements about Huffman Coding answer: [Huffman tree is only imp.... non-recursive..][David Huffman's ...may no t be useful for sending..][Adaptive Huffman coding uses breath-first left-to-rig ht... counter] 35. Select correct statement about Run-length encoding answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs 36. Identify whether below code has error or not answer: abstract class AC1{ int AC1f1() {return 0;}void AC1f2(int i) {return ;} int AC1f3();} ==> compile error 37. Identify whether below code has error or not answer: interface I2{ double I2f1(); void I2f2(int i); void I2f1(); double I2f3( ){return 10;}; int n =10; pri double m;} ==>3 compile errors 38. Which of the following statements are true answer: [object1.process2('N') calls process2 of class ExtC][object2.process1(1)  
  
does not issue compile error][object2.process3('N') call process 3 of class C] 39. Identify which alogrithm the above code implements answer: for(int i = first, j; i<=last; i++){int tmp = data[i]; for(j=i; j>0 && t mpInsertion Sort 40. Identify which alogrithm the above code implements answer: pulic extends Com........{ for(int i=0;ii;--j) if(data[j].compareTo(data[j-1]) < 0) swap(data,j,j-1 );} ==> Bubble sort 41. Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is "ABCDEF\n" answer: public.... reverse(){char ch = getChar(); if(ch != '\n'){ reverse(); sou t(ch);}} ==>FEDCBA 42. What is output if nontail is called with i = 3 answer: void nontail(int i){if(i>0){nontail(i+1); sout(i+""); nontail(i+1);} ==> Runtime error 43. What is output if nontail is called with i = 5 answer: void nontail(int i){if(i>0){nontail(i-2); sout(i+""); nontail(i-2);} ==> 1315131 44. What is output if preorderVRL is executed and structure of Binary Tree is th e following image answer: 2 6 3 15 8 10 1 11 12 (lay ben phai roi lay ben trai) 45. What is output if breadthFirst is executed and structure of Binary Tree is t he following image answer: 2 6 8 3 15 10 1 11 12 (Tu tren xuong duoi, tu phai qua trai) 46. Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output aft er iteration i=5 of the outer for loop completed answer: {2,4,5,8,9,10,3} 47. Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output after iteration i=5 of the outer for loop completed answer: {19,18,14,10,6,5,15} or //{19,18,14,6,5,10,15}// 48. Let deleteFromHead be method used to delete the first element of generic sin gly linked list class. Identify whether above code has error or not answer: public T dele...(){T el = head.info; if(head==tail) head = tail=null; el se head=head.next; return el;} ==> There may be runtime error in some case 49. Identify whether the code of pop method has error or not answer: public class Stack{ pri java.util.Array.... pool = new java.ut.....; ... public T pop(){return pool.remove(pool.size()-1); ==> may be runtime error i n some case 50. Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is "ABCDEF\n" answer: public.... reverse(){char ch = getChar(); if(ch != '\n') reverse(); sout (ch);} (sout ngoai if) ==> \nFEDCBA 1. Consider the following soft algorithm answer: public extends...... void insertionsort....{for(int i=1,j;i descending order 2. Which of the following strategies fit to binary Search trees that only have s ome elements constantly accessed? answer: [Use the DSW][Use Self-Restructuring][Use the AVL] 3. What is output after executing unknown(s,0,12), where s = "1352467642135"? answer: Stack overflow error 4. What is the worst-case time for finding an element in a Binary tree? answer: O(n^2} 5. Which of the following problems may use the recursion technique answer: detect a cycle in a graph 6. Identify which alogrithm the above code implements answer: moveDown(data,0,i-1) ==> bubble sort 7. When a method call is executed, which information does it activation record c ontain?  
  
answer: None 8. Which of the following algorithms in graphs can be implemented by extending D epth First Search algorithm answer: All of the others 9. Which of the following problems may use stacks implicitly or explicitly answer: All 10. Which of the following statements are true answer: [The complexity of Breadth First.... is O(|V|+|E|)][The Depth First Sear ch for graph traversal.... nectivity and undirected] 11. Suppose temp refers to the third node in the doubly linked list that has mor e than 5 nodes. What statament changes temp so that it refers to the first node answer: temp = temp.previous.next.next.previous 12. A queue is implemented using a doubly linked list, which of the following op erations require O(n) time? answer: clear(remove all elements from the queue) 13. Which traversal method is used in Adaptive Huffman tree? answer: Breadth First traversal 15. What is the complexity of inserting a node in a perfectly balanced tree for worst case? answer: O(lgn) 16. This method is used to answer: {.... return s.subtring(0,1)+unknown(s,substring(1),ch);}return "";} ==> removes the first occurrence of the specified character from the string ... 17. In the array implementation of the queue, which operations require constant time? answer: isEmpty 18. Which of the following statements about the Stack are true answer: [Clear operation in the linked list .... constant time O(1)][Popping ope ration in the linked list ....constant time O(1)] 19. Suppose that obj is an Object variable and that it refers to an Integer obje ct. If s is a String variable, then which statement is correct about the assignm ent "s=(String) obj;"? answer: The statement will compile, but there will be a run-time exception 20. A chained hash table has an array size of 1024. What is the maximum number o f entries that can be placed in the table answer: There is no maximum 21. Which of the following definitions about a collision in a hash table are inc orrect answer: Two entries with different data have the exact same key 22. Which of the following statements about Run-Length encoding are false answer: run-length encoding cannot be applied to compress fax images 23. A recursive method may be eliminated by using answer: [Iteration statements][Stacks] 24. "What is number of comparisons in the worst case for mergesort to sort an ar ray of n elements?" answer: O(n^2) 25. Which of these operations are likely to have a constant time for worst-case in the singly linked lists? answer: None 26. Which of the following Sorting algorithms have complexity of O(n) in best ca se answer: All 27. Which of the following Sorting algorithms use Divide and Conquer strategy answer: Quick sort 28. What is the number of comparisons and swaps in the best case for creating a heap using top down method (William's method) answer: The number of comparisons is 2.[n/2] and swaps is zero 29. Which of the following statements about Merge sort method are incorrect answer: Merge sort can be made more efficient by replacing recursion with iterat  
  
ion 30. Which of the statements about Ziv-Lampel Code are false answer: None 31. Select incorrect statement about skip list answer: [Insertion and Deletion are very inefficient][The search time is O(lgn) in the worst case 32. Select correct statement about Ziv-Lemepel Code answer: [uses buffer of symbols][The codeword of Ziv-Lemepel Code is a triple] 33. Algorithms are applied to graphs answer: [Depth First Search][Breadth first Search] 34. Suppose temp refers to some node in a doubly linked list. What boolean expre ssion can be used to check whether temp refers to the first node of the list answer: temp.previous.next.previous == null 35. Suppose that obj is an Object variable and that it refers to an Integer obje ct. If s is a String variable, then which statement is correct about the assignm ent "s = (String) obj;"? answer: The statement will compile and run with no exception 36. When a method call is executed, which information is not saved in the activa tion record answer: Location where the method should return when done What is written to the screen for the input "HowAre\*\*\*You\*\*To\*\*\*Day"? answer: HowAreYou Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex F. What are the correct order of vertices selected into the set S until the vertex F is selected? answer: A,C,D,F Consider the binary tree below. Which statement is correct? answer: The tree is neither complete nor full 7 5 6 4 3 9 8 2 answer: 7 5 6 4 3 9 8 2 1 Consider the AVL tree below. What is the breadth first traversal of the tree aft er inserting a node with value 22? answer: 35,20,45,10,25,40,22,30 Suppose we are considering a singly linked list and p is some node in the list w hich has successor node. Select the most correct java code snippet that deletes the successor node of p(the node after p). anser: Node q =p.next; p.next=q.next. Suppose a doubly linked list of integers is given below and tail is a reference to the last node in the list: (head) 7 1 6 4 3 9 8 2 (tail) answer: 7 1 6 4 3 9 8 5 2 Specify the correct implementation of dequeue() menthod of a queue. This queue u ses java.uti.LinkedList for storing data and the head of the list is treated as the head of the queue. answer: Object dequeue() {if(isEmpty()) return(null);return(pool.removeFirst()) ;} void fun(int n) { if(n < 0) { System.out.println("-"); fun(-n); } else if( n<15 )System.out.println } answer: n >= 15 7, 5, 11, 12, 3, 10, 2, 4, 8, 6 answer: 2,3,11,12,5,10,7,4,8,6 Specify the correct statement about hashing algorithm? answer: If the coalesced method is used for collision resolution, insertion and searching(and sometimes deletion)always take constanttime:0(1) B: 32%  
  
C: 28% D: 16% E: 6% F: 18% answer: 001 Suppose a G is given below(view picture). Which of the followings is the Hamilto n cycle from the vertex B, created by above algorithm? answer: B A F D E C B What is the value of the Boundary Folding Hash Function if K = 42-65-76-7 and TS ize = 100? answer: 82 Suppose we are considering a binary search tree. Select the most correct java co de snippet that search a node with value x. answer: Node search(int x){Node p = root; While(p!=null && p.info!=x) if(x>p.inf o)p=p.left; else p=p.right;} Select the statement that is the most correct. answer: For a recursive method to terminate there must be on or more limit condi tions Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex B. what is the label of the vert ex D when the shortest path from A to B is determined? answer: 17 Select the most correct statement about the complexity of insertion sort answer: the best case is O(n), and the worst case is O(n2) consider the AVL tree below. What is the breadth first traversal of the tree aft er inserting a node with value 28 answer: 35 20 45 10 28 40 25 30 The operation for adding an entry to a queue is traditionally called: answer: enqueue 1 0 1 answer: int n,k; n=13 4 9 9 answer: int a,b; void set(int a1, int b1) What is the breadth-first traversal of a tree below after deleting the node 5 by merging? answer: 4 2 7 1 3 6 8 What is the value of the Shift Folding Hash Function if the key K =44-65-76-8 an d TSize=100 answer: 90 In a real computer, what will happen if you make a recursive call without making the problem smaller? answer: the results are nondeterministic To implement an AVL tree, aconcept balance factor is introduced(bal = height(rig ht)-hight(left)).Suppose an AVL tree is created by inserting to the tree the fol owing keys sequentially: 6, 4, 7, 3 ,5 ,2 What is the balance factor of the node 4 answer: -' 16, 5, 2, 11, 10, 8, 12, 3, 8, 6 answer: 2 5 16 11 10 8 12 3 8 6 Consider the AVL tree below. What is the preorder traversal of the tree af ter d eleting the node with value 40? answer: 12 22 27 32 35 45 Which of the following methods is used to collision resolution: answer: Cicheli's method The operation of visiting each element in the list exactly once is know as answer: Traverse Specify the correct statement about the fun() method in the code above answer: It removes the first element of the list 6, 4, 9, 10, 8, 3, 7, 5 answer: 3 4 5 6 8 7 9 10  
  
Suppose the f(n) function is defined on the set of integer numbers as below. Wha t is the valuse of f(-5)? answer: 3 State True or False:"In a binary search tree, all the nodes that are left descen dants of the node A have key values greater than A; all the node that are A's ri ght descendants have key values less than (or equal to)A." answer: False Suppose we are considering a singly linked list which has at least 2 nodes. Sele ct the most correct java code snippet that inserts new node with value x before the last node answer: dek biet Given a graph below. What is the output of depth-first traversal from vertex B?( visit nodes in ABc order if there are some nodes having the same selection abili ty) answer: B A E G C F D Given araw message 'BBBUUUUBBBUUBBBBBUU' answer: 3B4U4B3U2B5UU2 What is maximum nuber of activation records( including its caller ) in runtime s tack when calling TriangularNumber(10) answer: 9 Node q = p.next; p.next = q.next; answer: It deletes the node after p Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex B to the vertex F. What are the correct order of vertices selected into the set S until the vertex F is selected? answer: B C D F The complexity of heap sort is answer: 2 fun(-1012) answer: int fun(int n) 6, 4, 9, 10, 2, 8, 1, 3, 7, 5 answer: 4 6 9 2 8 1 3 7 5 10 Integer "j" is not initialized answer: for(int i=0;i<14;i++) 5 100 100 answer: (A h = new A(5)) B: 32% C: 28% D: 16% E: 6% F: 18% Using Huffman encoding, what is the code for character D? answer: 0' Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex F. what is the label of the vert ex E when the shortest path from A to F is determined? answer: infinity Node p1,p2;p1 = p.prev;// prev is a link to previous node answer: It deletes the node p Select the statement that is most correct. Which of the following applications m ay use a stack answer: store a waiting list of printing jobs Specify the most correct statement about chaining method for handing collision answer: in chaining, some positions of the table is associated with a linked lis t or chain of ... n>=0&&n<15 answer: void fun(int n) what is output when calling Triangularnumber(4) answer: 10  
  
Suppose a graph G is given by the adjacency matrix below. Which of the following s is the Hamilton cycle answer: A D E C B A Select incorrect statement about Data compression answer: Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance Specify the statement that is most correct about a circular linked list answer: Cicurlar linked list is a linked list in which the last node of the list points to the first node in the list What is written to the screen for the input"Good\*\*Morn\*\*in\*\*\*g"? answer: GoMg Specify the correct statement about open addressing method for handling collisio n answer: The collision is resloved by finding an available table entry orther tha t the position to which the colliding key is originally hashed Assume in direted graph edge uv means "vertex v depends on vertex u".What is val id topological sort the graph shown below: answer: A B D C E F G H Given a graph below. What is the output of breadth-fist traversal from vertex C ? answer: C B D A E F G 6, 7, 3, 1, 2, 5, 8 answer: 6 3 7 1 5 8 2 8, 5, 11, 12, 3, 10, 2, 4, 9, 6 answer: 2 3 11 12 5 10 8 4 9 6 Fill in blank to form a correct statement: " A recursive method is a method that invokes itself directly or indirectly. For a recursive method to terminate ther e must be one or more \_\_\_\_\_\_\_\_\_\_\_". answer: Limit conditions What is the breadth-first traversal of a tree below after deleting the node 5 by copying? answer: 4 2 7 1 3 6 8 Suppose a multigraph G is given by the adjacency matrix below. Which of the fool owings is the Euler cycle? answer: A B C B D A Select incorect statement about Object - Oriented Programming answer: Static methods and avariables are associated Which of the following keywords are access modifier answer: protected , private Select correct satements answer: In an abstract class , subclasses or derived classes , An abstract data type Which following statements are true answer: [2] An object can be saved , If the vector's Which the sentences about singly linked list are true answer: [3] Deleting a node ; On the average ; There is no immediate Select correct statement(s) about Doubly Linked list answer: [2] the node which ; Deleting a node Select incorrect statement about skip list answer: None of others Select incorrect statement about skip list answer: The search time is 0(lgn) Select false statement answer: In the array list, poping is executed in 0(lgn) Select true statements about stack answer: The java ; Stack can be implemented Which of the following methods of queue are true answer: isEmpty(); enqueue(el); firstEL() Which of the following can be executed in constant time O( n ) answer: When deleting a node , when deleting a node  
  
Which of the folowing statements are true answer: The return address; The recursive version When converting a method from a recursive version into an iterative version answer: The brevity of program formulaion; Program clarity Recursive definition on most computers are eventually implemented using a run-ti me stack and this implementation is done by the operating system answer: true In all cases, nonrecursive implementation is faster recursive implementation answer: true Which of the following concepts of the tree are true answer: the height ; the level ; the lever Select correct statement answer: The complrxity of searching depends on the shape of the tree and the pos ition of the node in the tree ; Breath-First; For a binary tree Select incorect statement answer: Depth-first traversal can not be implemented if not using stack ; A recu rsive ; Morri's algorithm Which of the following statement are true answer: Polish notaion ; Using polish notation; Expression trees Which of the following sentences are true answer: the complexity of DFS is O(|V|+|E|); To prevent loop Which of the statements about fiding the shortest path are true answer: For label ; Ford's ; the complexity of Dijkstra's algorithm is O(|v|2) Which of the sollowing statement about spanning tree is false answer: none of other Which of the following statements about graph coloring is true answer: In sequential coloring algorithm vertices must be ordered according to i ndices already to the vertices ; The complexity ; Sequential Which of the following statements about efficient sorting is false answer: Shell sort divides the original array into physical ; Only insertion Which of the following statements about efficient sorting is false answer: The worst case; The best case Which of the following statement is true answer: for obiject comparison In Insertion Sort, the number of moovements and comparisons for a radomly ardere d array is closer to the besr case answer: False Which of the following statement about Open Addressing are false answer: Using quadratic probing ; Which key can be stored Which of the following statement are true answer: Linked list ; Self-organizing; Coalesced Which of the following statement about Perfect Hash Function are true answer: Cichelli's method uses an exhaustive search ; Cichelli's method is used to hash relatively Select correct statements answer: A reorganization ; The characteristic Which of the following data structure can be implement Huffman Coding answer: Sigly linked list ; Priority queue ; Doubly linked list Select incorrect statements about Huffman Coding answer: Huffman tree is only implemented ; Adaptive Huffman coding Select correct statement about Run-lenght encoding answer: A serious drawback of run-length encoding Indentify whether below code has error or not answer: Compile error Assume the getChar() only reads one character of the input string every it is ca lled. What is output if reverse is executed and input string is "ABCDEF\n" answer: FEDCBA What is output if nontail is called with i = 3 answer: runtime error is issued What is output if nontail is called with i = 5  
  
answer: 1315131 what is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image answer: 2 6 3 15 8 10 1 11 12 what is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image answer: 2 6 8 3 15 10 1 11 12 {19,14,6,5,18,10,15} answer: {19,18,14,6,5,10,15} {9,4,2,5,8,10,3} answer: {2,4,5,8,9,10,3} Identify whether above code has error or not answer: There may be runtime error in some case Identify whether the code of opo method has error or not answer: There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is"ABCDEF\n" answer: \nFEDCBA Which statements are true about inheritance? a In Java the extends clause is used to specify inheritance b A subclass must define all the methods from the superclass. c A class can extend any number of other classes. d All of the others. Answer: In Java the extends clause is used to specify inheritance Which statements are true about interfaces? a The keyword implements is used to specify that a class inherits from an interface. b Members of an interface can always be declared static. c Interfaces can extend any number of other interfaces. d None of the others. Answer: Interfaces can extend any number of other interfaces. Which one of these for statements is valid a for (int i=10; i=0; i--) {} b for (int i=0, j=100; i0); i--) {} Answer: for (int i=0, j=100; i  
   
Answer: (temp.next == null) Suppose temp refers to a node in a linked list (using the SLLNode class with ins tance variables called info and next). What statement changes temp so that it re fers to the next node? a temp ++; b temp = next; c temp += next; d temp = temp.next; Answer: temp = temp.next; Which boolean expression indicates whether the data in two nodes (p and q) are t he same. Assume that neither p nor q is null. a p == q b p.info == q.info c p.next == q.next d None of the others. Answer: p.info == q.info Which of these operations are likely to have a constant time for worst-case in t he linked lists? a addBefore (add a new element into before an element in the list). b countOccurrences (count number of an element s present times in the list). c Delete (remove an element in the list). d None of the others. Answer: None of the others. The operation for adding an entry to a stack is traditionally called: a add b append c insert d push Answer: push In the array version of the Queue, which operations require O(n) time for their worst-case behavior? a dequeue b insert when the capacity has not yet been reached c isEmpty d None of the others Answer: None of the others Which of the following applications may use a stack? a A parentheses balancing program. b Keeping track of local variables at run time. c Syntax analyzer for a compiler. d All of the others. Answer: All of the others. In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? a dequeue b insert  
  
c d  
  
isEmpty None of the others  
  
Answer: None of the others When a method call is executed, which information is not saved in the activation record? a Local variables b Location where the method should return when done. c Current depth of recursion. d Values for all parameters to the method. Answer: Current depth of recursion. When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? a Primitive values are all treated as reference variables b Reference variables are all treated as primitive values c There is no duplication of local variables d None of the others. Answer: None of the others. Select correct statements about recursion Any iterative program can be written recursively. Every recursive method can be converted into an iterative version. Quicksort and mergesort are recursive in nature. All of the others. Answer: All of the others. Select a b c d the one TRUE statement. Every binary tree is either balanced or perfect balanced. Every balanced binary tree is also a perfect balanced binary tree. Every perfect balanced binary tree is also a balanced binary tree. No binary tree is both balanced and perfect balanced.  
  
Answer: Every perfect balanced binary tree is also a balanced binary tree.  
  
is visiting node starting from the highest (or lowest) level and moving down (or up el by level, visiting nodes on each level from left to right (or from right to l eft). a Breath-First Traversal b Depth-First Traversal c Stackless Depth-First Traversal d None of the others Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. a The DSW Algorithm b One classical method has been proposed by Adel son Vel skii and Landis (AVL tree). c All of the others d None of the others Answer: The DSW Algorithm  
  
A heap is an exellent way to implement a a stack b queue c priority queue d tree. Answer: priority queue  
  
..  
  
What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). a O(m) b O(n) c O(m2) d O(n2) Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? a Breadth-first search. b Depth-first search. Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? a Breadth first search. b Depth first search. c A cycle-finding algorithm. d A shortest-path algorithm. Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exams at the same time by applying a Graph coloring b Matching c Topological sort d Eulerian graph Answer: Graph coloring What is the worst-case time for mergesort to sort an array of n elements? a O(nlgn) b O(n) c O(n2) d O(lgn) Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? a O(nlgn) b O(n) c O(n2) d O(lgn) Answer: O(n2)  
  
Answer: a b c d  
  
What is the worst-case time for heapsort to sort an array of n elements? O(nlgn) O(n) O(n2) O(lgn)  
  
Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? a O(nlgn) b O(n) c O(n2) d None of the others Answer: O(n) What is the worst-case time for binary search finding a single item in an array? a Constant time b Logarithmic time c Linear time d Quadratic time Answer: Logarithmic time What is the best definition of a collision in a hash table? a Two entries are identical except for their keys. b Two entries with different data have the exact same key. c Two entries with different keys have the same exact hash value. d Two entries with the exact same key have different hash values. Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? a 256 b 511 c 512 d 1024 e There is no maximum Answer: There is no maximum Suppose you place m items in a hash table with an array size of s. What is the c orrect formula for the load factor? a s + m b s/m c s \* m d m/s e m - s Answer: m/s Which of the following data structure can be implement Huffman Coding b Singly linked list. c Priority queue. d All of the others e Doubly linked list.  
  
Answer: Doubly linked list. Select incorrect statements about restrictions need to be imposed on the prospec tive codes: a Each codeword may corresponds to one or many symbols. b Assume that symbols and have probabilities of occurrence , . If , t hen , where and . c Decoding should not require any look ahead. d There should not be any unused short codewords either as stand-alone enc odings or as prefixes for longer codewords. Answer: Each codeword may corresponds to one or many symbols. Answer: Select correct statement about Run-length encoding. a A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. b Run-length encoding is very useful when applied to files that are almost guaranteed to have many runs of at least five characters. c All of the others. d None of the others. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select a b c d correct statement about Ziv-Lempel Code. Ziv-Lempel Code uses buffer of symbols. The codeword of Ziv-Lempel Code is a triple. All of the others. None of the others.  
  
Answer: All of the others. Which statement is true about the following code? a Interface1 and Interface2 do not match, therefore, MyClass cannot implem ent them both. b The declarations of void g() in the two interfaces conflict, therefore, the code will not compile. c The declarations of int VAL\_B in the two interfaces conflict, therefore, the code will not compile. d Nothing is wrong with the code, it will compile without errors. Answer: Nothing is wrong with the code, it will compile without errors. What will be the result of attempting to compile and run a The program will fail to compile. b The program will compile without error and print c The program will compile without error and print d The program will compile without error and print the following program? 0 when run. 1 when run. 2 when run.  
  
Answer: The program will compile without error and print 2 when run. Which digits, and in which order, will be run? a The program will only print 1 and b The program will only print 1, 4, c The program will only print 3 and d The program will only print 1, 2, printed when the following program is 4, in that order. and 5, in that order. 5, in that order. 4, and 5, in that order.  
  
Answer: The program will only print 1, 4, and 5, in that order. Consider the following pseudocode: What is written to the screen for the input "ABBAABBA"? a ABABABAB b BABABABA c ABBAABBA d BAABBAAB Answer: ABBAABBA Consider the following method: What values of number are directly handled by the stopping case? a number < 0 b number < 10 c number >= 0 && number < 10 d number > 10 Answer: number >= 0 && number < 10 Consider the following sort algorithm: Number of comparisons of keys and comparisons of i and least is: a (n(n-1))/2 b n-1 c ((n-1)(n+2))/2 d None of the others. Answer: ((n-1)(n+2))/2 Consider the following sort algorithm: Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. What is outpu t after iteration i=4 of the outer for loop completed a 1, 2, 3, 4, 5, 6, 7 b 1, 2, 3, 7, 4, 5, 6 c 1, 2, 3, 4, 5, 7, 6 d 1, 2, 3, 4, 7, 5, 6 Answer: 1, 2, 3, 4, 5, 7, 6 Consider the following sort algorithm: Number of comparisons of keys is (n(n-1))/2 Answer: (n(n-1))/2 Consider the following algorithm: Which traversal does the above algorithm implement? a Breadth-first traversal b Inorder tree traversal c Postorder tree traversal d Preorder tree traversal Answer: Preorder tree traversal Consider the following sort algorithm: Select correct statements when applying this algorithm to a n-element array: a moveDown() is called times to create the heap in the first phase. b The heap is restored times in the second phase. c In the second phase, this algorithm exchanges times the root with the e lement in position. d All of the others.  
  
Answer: All of the others. Consider this method declaration: How many asterisks are printed by the method call quiz(5)? a 8 b 4 c 7 d None of the others. Answer: 7 Consider the following traversal algorithm: What is output if this algorithm is executed on the following binary tree: a 40 30 7 10 11 3 1 2 14 b 1 3 2 7 10 40 30 11 14 c 1 2 3 14 7 10 11 40 30 d 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 Consider the following algorithm What is output if this algorithm is executed on the following binary tree a 3 b 9 c 5 d 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception? a x = y; b z = x; c y = (B) x; d z = (C) y; e y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same package as the class of the method. How can such a restriction be enforce d? a Declare the method with the keyword public. b Declare the method with the keyword protected. c Declare the method with the keyword private. d Do not declare the method with any accessibility modifiers. Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? a \_class b $value$ c zer@ d Angs\_trom Answer: zer@ Which statement concerning the switch construct is true? a All switch statements must have a default label.  
  
b c nt. d  
  
A character literal can be used as a value for a case label The keyword continue can never occur within the body of a switch stateme All of the others.  
  
Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? a (new Integer(str)).intValue() b Integer.intValue(str) c Integer.getInt(str) d ((int) str) Answer: (new Integer(str)).intValue() Select a b . c d correct statements about a singly linked list. Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list All of the others None of the others.  
  
Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: a Quick searching. b All of the others. c None of the others. d Size can be expanded and shrunk rapidly. Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: a Insert a node into any position in Linked List. b Delete a node in position which is followed by the last node. c All of the others. d None of the others. Answer: All of the others. Select correct statements about a singly linked list. a A new node can be inserted into any position, except first position, wit hout any traversal. b Deleting a node at the beginning of a list involves setting head to poin t to head.next. c All of the others. d None of the others. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Propertie of a stack is: a Multiple-items can be accessed at once. b Only one item can be accessed at once. c None of the others. Answer: Only one item can be accessed at once.  
  
Properties of a queue are: a Only one item can be accessed at once. b Multiple-items can be accessed at once. c None of the others. Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? a is\_empty b topEl c pop d push when the array is not yet full. e None of these operations require linear time. Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. a is\_empty b topEl c pop d push. e None of these operations require linear time. Answer: pop Select wrong statements: a Recursion is always more efficient than loops. b Recursion can make the conceptual design of an algorithm s implementation easier. c Recursion gone wrong can lead to overflow stack errors d Recursion can be only replaced by iteration. Answer: Recursion can be only replaced by iteration. In a single method declaration, what is the maximum number of statements that ma y be recursive calls? a 1 b 2 c n (where n is the argument). d There is no fixed maximum Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: a Recursion. b Iteration. c Stack. d All of the others. Answer: All of the others. Consider algorithm of the 8-queen problem: putQueen(row) for every position col on the same row if position col is available place the next queen in position col; if (row < 8)  
  
putQueen(row+1); else success; remove the queen from position col; Which of the following statements are true: a The algorithm end after finding one solution. b The algorithm does not find symmetric solutions. c The algorithm finds all solutions. Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? a 10 b 15 c 20 d 30 Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? a The rightmost node of the left subtree of the deleted node. b The smallest sibling node. c The parent node. d None of the others. Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del . eted from the tree using a The DSW algorithm. b AVL tree. c Creating a binary search tree from an ordered array. d None of the others. Answer: AVL tree. The DSW Algorithm uses: a Right rotation. b Left rotation. c All of the others. d None of the others. Answer: All of the others. The depth-first search algorithm for a graph: a Searches for the minimal edges needed to visit each vertex in the graph. b Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. c Checks all adjacent vertices before moving down the paths to find the de stination. d None of the others. Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements: a Djikstra's shortest path algorithm can be applied to undirected graph. b The breadth-first search can be used to find the shortest path from a so urce vertex to the destination vertex  
  
c d  
  
All of the others. None of the others.  
  
Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? a The Kruskal algorithm. b The Dijkstra algorithm. c All of the others. d None of the others. Answer: All of the others. Which of the following statements about shortest path finding algorithms are tru e: a Dijkstra s algorithm is label-setting algorithm. b Dijkstra s algorithm can be applied to graphs have negative weights. c The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of v ertices of graph. d All of the others. Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? a Each component of the array requires a large amount of memory. b Each component of the array requires a small amount of memory. c The array has only a few items out of place. d The processor speed is fast. Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? a The array elements form a heap. b Elements in each half of the array are sorted amongst themselves. c Elements in the first half of the array are less than or equal to elemen ts in the second half of the array. d None of the others Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? a The algorithm might be either selectionsort or insertionsort. b The algorithm might be selectionsort, but it is not insertionsort. c The algorithm is not selectionsort, but it might be insertionsort. d The algorithm is neither selectionsort nor insertionsort. Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: a The first item of array. b The middle item of array. c The last item of array. d All of the others.  
  
Answer: All of the others. The more complex the hashing functions, the better it is a True b False Answer: False Which of the following methods are used to collision resolution: a Folding. b Cichelli s method. c Open addressing. d FHCD Answer: Open addressing. Which of the following hashing methods can cause collision: a Division b Folding c Mid-Square d Extraction e All of the others. Answer: All of the others. Select incorrect statements: a Quadratic probing eliminates primary clustering but suffers from the les s severe secondary clustering. b In double hashing the step size depends on the key and is obtained from a secondary hash function. c In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. d None of the others. Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: a Each codeword corresponds to exactly one symbol. b No codeword is a prefix of another codeword. c The length of the codeword for a given symbol mj should not exceed the l ength of the codeword of a less probable symbol mÂ¬i. Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others Answer: Huffman algorithm can be only applied to text files.  
  
Answer: The Huffman algorithm always produces a unique binary tree. a True b False Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. a True b False Answer: True Select a b uffman c d incorrect statements about Data compression: Huffman tree can be only constructed bottom-up. In adaptive Huffman encoding, sibling property is retained assures the H tree under construction is still a Huffman tree. All of the others. None of the others.  
  
Answer: Huffman tree can be only constructed bottom-up. Given the following interface definition, which definition is valid? interface B extends I{ void increment(); } Answer: interface B extends I{ void increment(); } Which expressions will evaluate to true if preceded by the following code? a (a == "Hello") b (a == b) c (a == c) d a.equals(b) Answer: (a == c) || a.equals(b) Consider the following alogorithm: What is output when calling TriangularNumber(4) a 6 b 10 c 15 d 20 Answer: 10 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10) a 7 b 9 c 11 d 13 Answer: 11 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? a 4 b 5  
  
c d  
  
3 6  
  
Answer: 5 Consider the following alogorithm: What is maximum number of elements in queue when traversing the below tree using the above algorithm? a 4 b 5 c 6 d 3 Answer: 4 onsider the following alogorithm: Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop. a {15,12,2,11,10,6,3,1,8} b {15,12,6,11,10,2,3,1,8} c {8,12,6,11,10,2,3,1,15} d None of the others Answer: {15,12,6,11,10,2,3,1,8} Consider the following alogorithm: Select right statements: a In the first loop, moveDown is called n/2 times in any case. b The total number of moves in all executions of moveDown in the second ph ase is O(lgn). c All of the others. d None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. What will be printed when the following program is run? a 0 b 1 c 2 d An error occurs when compiling the program. Answer: 2 What will be printed when the following program is run? a this is g of A b this is g of C c An error occurs when compiling the program. d Nothing is printed. Answer: this is g of C  
  
Consider the following alogorithm: Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. a {3,4,8,10,12,17,5,14,13} b {3,4,10,8,12,17,5,14,13} c {10,8,4,3,12,17,5,14,13} d {3,4,5,8,10,12,13,14,17} Answer: {3,4,8,10,12,17,5,14,13}  
  
Consider the following alogorithm How many times is number 840 printed out when call pattern(840) a 2 b 4 c 6 d 8 Answer: 2 Consider the following alogorithm: How many integers will the program print when calling nonTail(n), n > 0. a 2n b 2n - 1 c 2n d 2n -1 Answer: 2n - 1 Consider the following alogorithm: The above algorithm is used to: a Count number of even values in binary tree. b Print even numbers in binary tree. c Print even numbers in ascending order. d Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Consider the following alogorithm: a Count number of nodes in binary tree. b Calculate height of binary tree. c Count number of nonterminal nodes in binary tree. d None of the others. Answer: Calculate height of binary tree. Consider the following alogorithm: The above algorithm is used to: a Check whether binary tree is balanced. b Check whether height of left subtree is greater than height of right sub tree. c Check whether height of right subtree is greater than height of left sub tree. d None of the others. Answer: Check whether binary tree is balanced. Question 1:Which statements are true about inheritance? a.In Java the extends clause is used to specify inheritance b.A subclass must define all the methods from the superclass. c.A class can extend any number of other classes. d.All of the others. Answer:In Java the extends clause is used to specify inheritance Question 2:Which statements are true about interfaces? a.The keyword implements is used to specify that a class inherits from an interf ace b.Members of an interface can always be declared static. c.Interfaces can extend any number of other interfaces. d.None of the others. Answer:Interfaces can extend any number of other interfaces.  
  
Question 3:Which statements are false a.for (int i=10; i=0; i--) {} b.for (int i=0, j=100; i0); i--) {} Answer:for (int i=0, j=100; i  
   
about modifiers? {;} += 2; } --j) {;}  
  
Question 4:Suppose temp refers to a node in a linked list (using the SLLNode cla ss with instance variables called info and next). What boolean expression will b e true when temp refers to the tail node of the list? a.(temp == null) b.(temp.next == null) c.(temp.info == null) d.None of the above. Answer:(temp.next == null) Question 5:Suppose temp refers to a node in a linked list (using the SLLNode cla ss with instance variables called info and next). What statement changes temp so that it refers to the next node? a.temp++; b.temp=next; c.temp+=next; d.temp=temp.next; Answer:temp=temp.next; Question 6:Which boolean expression indicates whether the data in two nodes (p a nd q) are the same. Assume that neither p nor q is null. a.p==q; b.p.info==q.info; c.p.next=q.next; d.None of the others Answer:.p.info==q.info; Question 7:Which of these operations are likely to have a constant time for wors t-case in the linked lists? a.addBefore (add a new element into before an element in the list).. b.countOccurrences (count number of an element s present times in the list). c.Delete (remove an element in the list). d.None of the others. Answer:None of the others. Question 8:The operation for adding an entry to a stack is traditionally called: a.add b.append c.insert d.push Answer:push Question 9:In the array version of the Queue, which operations require O(n) time for their worst-case behavior? a.dequeue b.insert when the capacity has not yet been reached c.isEmpty d.None of the others Answer:None of the others Question 10:Which of the following applications may use a stack? a.A parentheses balancing program. b.Keeping track of local variables at run time.  
  
c.Syntax analyzer for a compiler. d.All of the others. Answer:All of the others. Question 11:In the linked-list version of the Queue, which operations require li near time for their worst-case behavior? a.dequeue b.insert c.isEmpty d.None of the others Answer:None of the others Question 12:When a method call is executed, which information is not saved in th e activation record? a.Local variables b.Location where the method should return when done. c.Current depth of recursion. d.Values for all parameters to the method. Answer:Current depth of recursion. Question 13:When the compiler compiles your program, how is a recursive call tre ated differently than a non-recursive method call? a.Primitive values are all treated as reference variables b.Reference variables are all treated as primitive values c.There is no duplication of local variables d.None of the others Answer:None of the others Question 14: a. b. c. d. Answer: Question 15:Select the one TRUE statement. a.Every binary tree is either balanced or perfect balanced. b.Every balanced binary tree is also a perfect balanced binary tree. c.Every perfect balanced binary tree is also a balanced binary tree. d.No binary tree is both balanced and perfect balanced. Answer:Every perfect balanced binary tree is also a balanced binary tree. Question 16:\_\_\_\_\_\_\_\_ is visiting node starting from the highest (or lowest) leve l and moving down (or up) level by level, visiting nodes on each level from left to right (or from right to left). a.Breath-First Traversal b.Depth-First Traversal c.Stackless Depth-First Traversal d.None of the others Answer:Breath-First Traversal Question 17:\_\_\_\_\_\_\_\_ rebalances the tree globally; each and every node could hav e been involved in rebalancing either by moving data from nodes or by creasing n ew values to reference fields. a.The DSW Algorithm b.One classical method has been proposed by Adel son Vel skii and Landis (AVL tree). c.All of the others d.None of the others Answer:The DSW Algorithm  
  
Question 18:A heap is an exellent way to implement a \_\_\_\_\_\_\_\_ a.stack b.queue c.priority queue d.tree. Answer:priority queue Question 19:What is the expected number of operations needed to loop through all the edges terminating at a particular vertex given an adjacency matrix represen tation of the graph? (Assume n vertices are in the graph and m edges terminate a t the desired node). a.O(m) b.O(n) c.O(m2) d.O(n2) Answer:O(n) Question 20:What graph traversal algorithm uses a queue to keep track of vertice s which need to be processed? a.Breadth-first search. b.Depth-first search. c. d. Answer:Breadth-first search. Question 21:Suppose you have a directed graph representing all the flights that an airline flies. What algorithm might be used to find the best sequence of conn ections from one city to another? a.Breadth first search. b.Depth first search. c.A cycle-finding algorithm. d.A shortest-path algorithm. Answer:A shortest-path algorithm. Question 22:The final exams at a university can be scheduled so that no student has two exams at the same time by applying \_\_\_\_\_\_\_\_\_\_ a.Graph coloring b.Matching c.Topological sort d.Eulerian graph Answer:Graph coloring Question 23:What is the worst-case time for mergesort to sort an array of n elem ents? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(nlgn) Question 24:What is the worst-case time for bublesort to sort an array of n elem ents? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(n2) Question 25:What is the worst-case time for heapsort to sort an array of n eleme nts?  
  
a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(nlgn) Question 26:In a selectionsort of n elements, how many times are the array eleme nts moved in the worst case? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(n) Question 27:What is the worst-case time for binary search finding a single item in an array? a.Constant time b.Logarithmic time c.Linear time d.Quadratic time Answer:Logarithmic time Question 28:What is the best definition of a collision in a hash table? a.Two entries are identical except for their keys. b.Two entries with different data have the exact same key. c.Two entries with different keys have the same exact hash value d.Two entries with the exact same key have different hash values. Answer:have the same exact hash value Question 29:A chained hash table has an array size of 512. What is the maximum n umber of entries that can be placed in the table? a.256 b.511 c.512 d.1024 e.There is no maximum Answer:There is no maximum Question 30:Suppose you place m items in a hash table with an array size of s. W hat is the correct formula for the load factor? a.s + m b.s/m c.s \* m d.m/s e.m - s Answer:m/s Question 31:Which of the following data structure can be implement Huffman Codin g a.Singly linked list. b.Priority queue. c.All of the others d.Doubly linked list. Answer:All of the others Question 32:Select incorrect statements about restrictions need to be imposed on the prospective codes: a.Each codeword may corresponds to one or many symbols. b.Assume that symbols and have probabilities of occurrence , . If , then , where and .  
  
c.Decoding should not require any look ahead. d.There should not be any unused short codewords either as stand-alone encodings or as prefixes for longer codewords. Answer:Each codeword may corresponds to one or many symbols. Question 33:Select correct statement about Run-length encoding. a.A serious drawback of run-length encoding is that it relies entirely on the oc currences of runs. b.Run-length encoding is very useful when applied to files that are almost guara nteed to have many runs of at least five characters. c.All of the others. d.None of the others. Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs. Question 34:Select correct statement about Ziv-Lempel Code. a.Ziv-Lempel Code uses buffer of symbols. b.The codeword of Ziv-Lempel Code is a triple. c.All of the others. d.None of the others. Answer:All of the others. Question 35:Which statement is true about the following code? a.Interface1 and Interface2 do not match, therefore, MyClass cannot implement th em both. b.The declarations of void g() in the two interfaces conflict, therefore, the co de will not compile. c.The declarations of int VAL\_B in the two interfaces conflict, therefore, the c ode will not compile. d.Nothing is wrong with the code, it will compile without errors. Answer:Nothing is wrong with the code, it will compile without errors. Question 36:What will be the result of attempting to ng program? a.The program will fail to compile. b.The program will compile without error and print 0 c.The program will compile without error and print 1 d.The program will compile without error and print 2 Answer:and print 2 when run compile and run the followi when run. when run. when run.  
  
Question 37:Which digits, and in which order, will be printed when the following program is run? a.The program will only print 1 and 4, in that order. b.The program will only print 1, 4, and 5, in that order. c.The program will only print 3 and 5, in that order. d.The program will only print 1, 2, 4, and 5, in that order. Answer:1, 4, and 5, in that order. Question 38:What is written to the screen for the input "ABBAABBA"? a.ABABABAB b.BABABABA c.ABBAABBA d.BAABBAAB Answer:ABBAABBA Question a.number b.number c.number d.number 39:What values of number are directly handled by the stopping case? < 0 < 10 >= 0 && number < 10 > 10  
  
Answer:number >= 0 && number < 10 Question 40:Number of comparisons of keys and comparisons of i and least is: a.n(n-1)\2 b.n-1 c.(n-1)(n+2)\2 d.None of the others. Answer:(n-1)(n+2)\2 Question 41:Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. W hat is output after iteration i=4 of the outer for loop completed a.1, 2, 3, 4, 5, 6, 7 b.1, 2, 3, 7, 4, 5, 6 c.1, 2, 3, 4, 5, 7, 6 d.1, 2, 3, 4, 7, 5, 6 Answer:1, 2, 3, 4, 5, 7, 6 Question 42:Number of comparisons of keys is a.n(n+1)\2 b.n(n-1)\2 c.n^2 d.n^2\2 Answer:n(n-1)\2 Question 43:Which traversal does the above algorithm implement? a.Breadth-first traversal b.Inorder tree traversal c.Postorder tree traversal d.Preorder tree traversal Answer:Preorder tree traversal Question 44:Select correct statements when applying this algorithm to a n-elemen t array: a.moveDown() is called times to create the heap in the first phase. b.The heap is restored times in the second phase. c.In the second phase, this algorithm exchanges times the root with the element in position. d.All of the others. Answer:All of the others. Question 45:How many asterisks are printed by the method call quiz(5)? a.8 b.4 c.7 d.None of the others. Answer:7 Question 46:What is output if this algorithm is executed on the following binary tree: a.40 30 7 10 11 3 1 2 14 b.1 3 2 7 10 40 30 11 14 c.1 2 3 14 7 10 11 40 30 d.14 2 1 3 11 10 7 30 40 Answer:40 30 7 10 11 3 1 2 14 Question 47:What is output if this algorithm is executed on the following binary tree2: a.3 b.9 c.5  
  
d.8 Answer:5 Question 48:Which statement, when inserted at the indicated position in the foll owing code, will cause a runtime exception? a.x = y; b.z = x; c.y = (B) x; d.z = (C) y; e.y = (A) y; Answer: Question 49:Which statements are false about modifiers? a.A final methods or field cannot be changed by derived classes. b.Methods and fields declared public can be used by any other object. c.The default modifier means that a method or a field is a accessible to derived classes. d.None of the others. Answer:The default modifier means that a method or a field is a accessible to de rived classes. Question 50:A method within a class is only accessible by classes that are defin ed within the same package as the class of the method. How can such a restrictio n be enforced? a.Declare the method with the keyword public. b.Declare the method with the keyword protected. c.Declare the method with the keyword private. d.Do not declare the method with any accessibility modifiers. Answer:Do not declare the method with any accessibility modifiers. Question 51:Which are invalid identifiers? a.\_class b.$value$ c.zer@ d.Angs\_trom Answer:zer@ Question 52:Which statement concerning the switch construct is true? a.All switch statements must have a default label. b.A character literal can be used as a value for a case label c.The keyword continue can never occur within the body of a switch statement. d.All of the others. Answer:A character literal can be used as a value for a case label Question 53:If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? a.(new Integer(str)).intValue() b.Integer.intValue(str) c.Integer.getInt(str) d.((int) str) Answer:(new Integer(str)).intValue() Question 54:Select correct statements about a singly linked list. a.Linked lists allow random access to any node. b.A node with a specified value (info) can be found by traversing the list. c.All of the others d.None of the others Answer:A node with a specified value (info) can be found by traversing the list. Question 55:Advantages which linked list have over an array:  
  
a.Quick searching. b.All of the others. c.None of the others. d.Size can be expanded and shrunk rapidly. Answer:Size can be expanded and shrunk rapidly. Question 56:Which of the following methods take O(n) time for the worst case: a.Insert a node into any position in Linked List. b.Delete a node in position which is followed by the last node. c.All of the others. d.None of the others. Answer:All of the others Question 57:Select correct statements about a singly linked list. a.A new node can be inserted into any position, except first position, without a ny traversal. b.Deleting a node at the beginning of a list involves setting head to point to h ead.next. c.All of the others. d.None of the others. Answer:Deleting a node at the beginning of a list involves setting head to point to head.next. Question 58:Propertie of a stack is: a.Multiple-items can be accessed at once. b.Only one item can be accessed at once. c.None of the others. d. Answer:Only one item can be accessed at once. Question 59:Properties of a queue are: a.Only one item can be accessed at once. b.Multiple-items can be accessed at once. c.None of the others. d. Answer:Only one item can be accessed at once. Question 60:In the array version of the Stack class, which operations require li near time for their worst-case behavior? a.is\_empty b.topEl c.pop d.push when the array is not yet full. e.None of these operations require linear time. Answer:None of these operations require linear time. Question 61:In the linked-list version of the Stack class, which operations requ ire linear time for their worst-case behavior? Assume that addtoTail, deletefrom Tail are used. a.is\_empty b.topEl c.pop d.push when the array is not yet full. e.None of these operations require linear time. Answer:pop Question 62:Select wrong statements: a.Recursion is always more efficient than loops. b.Recursion can make the conceptual design of an algorithm s implementation easier .  
  
c.Recursion gone wrong can lead to overflow stack errors d.Recursion can be only replaced by iteration. Answer:Recursion is always more efficient than loops. Question 63:In a single method declaration, what is the maximum number of statem ents that may be recursive calls? a.1 b.2 c.n (where n is the argument). d.There is no fixed maximum Answer:There is no fixed maximum Question 64:The problem of printing an input line in reverse order can be implem ented using: a.Recursion. b.Iteration. c.Stack. d.All of others Answer:Recursion Question 65:Which of the following statements are true: a.The algorithm end after finding one solution. b.The algorithm does not find symmetric solutions. c.The algorithm finds all solutions. d. Answer:The algorithm finds all solutions. Question 66:On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? a.10 b.15 c.20 d.30 Answer:20 Question 67:To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? a.The rightmost node of the left subtree of the deleted node. b.The smallest sibling node. c.The parent node. d.None of the others. Answer:The rightmost node of the left subtree of the deleted node. Question 68:Tree balancing can be performed locally after an element is inserted into or deleted from the tree using . a.The DSW algorithm. b.AVL tree. c.Creating a binary search tree from an ordered array. d.None of the others. Answer:AVL tree. Question 69:The DSW Algorithm uses: a.Right rotation. b.Left rotation. c.All of the others. d.None of the others. Answer:All of the others. Question 70:The depth-first search algorithm for a graph: a.Searches for the minimal edges needed to visit each vertex in the graph. b.Travels all possible paths from a vertex to see if it can find the destination  
  
before it moves on to the adjacent vertices. c.Checks all adjacent vertices before moving down the paths to find the destinat ion. d.None of the others. Answer:Travels all possible paths from a vertex to see if it can find the destin ation before it moves on to the adjacent vertices. Question 71:Select right statements: a.Djikstra's shortest path algorithm can be applied to undirected graph. b.The breadth-first search can be used to find the shortest path from a source v ertex to the destination vertex c.All of the others. d.None of the others. Answer:All of the others. Question 72:Two algorithms which used for finding a minimum spanning tree are Kr uskal and Dijkstra. Which algorithm uses the cycle detection method? a.The Kruskal algorithm. b.The Dijkstra algorithm. c.All of the others. d.None of the others. Answer:All of the others. Question 73:Which of the following statements about shortest path finding algori thms are true: a.Dijkstra s algorithm is label-setting algorithm. b.Dijkstra s algorithm can be applied to graphs have negative weights. c.The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertice s of graph. d.All of the others. Answer:Dijkstra s algorithm is label-setting algorithm. Question 74:When is Insertionsort a good choice for sorting an array? a.Each component of the array requires a large amount of memory. b.Each component of the array requires a small amount of memory. c.The array has only a few items out of place. d.The processor speed is fast. Answer:The array has only a few items out of place. Question 75:Mergesort makes two recursive calls. Which statement is true after t hese recursive calls finish, but before the merge step? a.The array elements form a heap. b.Elements in each half of the array are sorted amongst themselves. c.Elements in the first half of the array are less than or equal to elements in the second half of the array. d.None of the others Answer:Elements in each half of the array are sorted amongst themselves. Question 76:Suppose we are sorting an array of eight integers using a some quadr atic (O(n2))) sorting algorithm. After four iterations of the algorithm's main l oop, the array elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? a.The algorithm might be either selectionsort or insertionsort. b.The algorithm might be selectionsort, but it is not insertionsort. c.The algorithm is not selectionsort, but it might be insertionsort. d.The algorithm is neither selectionsort nor insertionsort. Answer:not selectionsort, but it might be insertionsort. Question 77:In Quicksort, the bound value (pivot) is:  
  
a.The first item of array. b.The middle item of array. c.The last item of array. d.All of the others. Answer:All of the others. Question 78:The more complex the hashing functions, the better it is a.True b.False c. d. Answer:b.False Question 79:Which of the following methods are used to collision resolution: a.Folding b.Cichelli s method. c.Open addressing. d.FHCD Answer:Open addressing. Question 80:Which of the following hashing methods can cause collision: a.Division b.Folding c.Mid-Square d.Extraction e.All of others Answer:All of others Question 81:Select incorrect statements: a.Quadratic probing eliminates primary clustering but suffers from the less seve re secondary clustering. b.In double hashing the step size depends on the key and is obtained from a seco ndary hash function. c.In quadratic probing the offset from x is the square of the step number, so th e probe goes to x, x+1, x+2, x+3, x+4, and so on. d.None of the others. Answer:In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Question 82:Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: a.Each codeword corresponds to exactly one symbol. b.No codeword is a prefix of another codeword. c.The length of the codeword for a given symbol mj should not exceed the length of the codeword of a less probable symbol mÂ¬i. d.all of otehrs Answer:No codeword is a prefix of another codeword. Question 83:Select incorrect statements about Data compression: a.Huffman algorithm can be implemented using priority queue. b.Huffman algorithm applied to case of the probabilities of symbol are known in advance. c.Huffman algorithm can be only applied to text files. d.All of the others Answer:Huffman algorithm can be only applied to text files.  
  
Question 84:The Huffman algorithm always produces a unique binary tree. a.True b.False c. d. Answer:False Question 85:Select incorrect statements about Data compression: a.Huffman tree can be only constructed bottom-up. b.In adaptive Huffman encoding, sibling property is retained assures the Huffman tree under construction is still a Huffman tree. c.All of the others. d.None of the others. Answer:Huffman tree can be only constructed bottom-up. Question 86:Given the following interface definition, which definition is valid? Which expressions will evaluate to true if preceded by the following code? a.(a == "Hello") b.(a == b) c.(a == c) d.a.equals(b) Answer:a.equals(b);(a == c) Question 87:is output when calling TriangularNumber(4) a.6 b.10 c.15 d.20 Answer:10 Question 88:What is maximum number of activation records (including its caller) in runtime stack when calling TriangularNumber(10) a.7 b.9 c.11 d.13 Answer:11 Question 89:What is maximum number of activation records (including its caller) in runtime stack when traversing the below tree using the above algorithm? a.4 b.5 c.3 d.6 Answer:5 Question 90:Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after endi ng the first loop. a.{15,12,2,11,10,6,3,1,8} b.{15,12,6,11,10,2,3,1,8} c.{8,12,6,11,10,2,3,1,15} d.None of the others Answer:{15,12,6,11,10,2,3,1,8} Question 91:Select right statements: a.In the first loop, moveDown is called n/2 times in any case. b.The total number of moves in all executions of moveDown in the second phase is O(lgn). c.All of the others.  
  
d.None of the others. Answer:In the first loop, moveDown is called n/2 times in any case. Question 92:What will be printed when the following program is run? a.0 b.1 c.2 d.An error occurs when compiling the program. Answer: Question 93:What will be printed when the following program is run? a. this is g of A b. this is g of C c.An error occurs when compiling the program. d.Nothing is printed. Answer: this is g of C Question 94:Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after exe cuting 4 iterations of outer loop. a.{3,4,8,10,12,17,5,14,13} b.{3,4,10,8,12,17,5,14,13} c.{10,8,4,3,12,17,5,14,13} d.{3,4,5,8,10,12,13,14,17} Answer:{3,4,8,10,12,17,5,14,13} Question 95:How many times is number 840 printed out when call pattern(840) a.2 b.4 c.6 d.8 Answer:2 Question 96:How many integers will the program print when calling nonTail(n), n > 0. a.2^n b.2^n-1 c.2n d.2n-1 Answer:2^n-1 Question 97:The above algorithm is used to: a.Count number of even values in binary tree. b.Print even numbers in binary tree. c.Print even numbers in ascending order. d.Print and count number of even values in binary tree. Answer:in binary tree. Question 98:The above algorithm is used to: a.Count number of nodes in binary tree. b.Calculate height of binary tree. c.Count number of nonterminal nodes in binary tree. d.None of the others. Answer:Calculate height of binary tree. Question 99:above algorithm is used to: a.Check whether binary tree is balanced. b.Check whether height of left subtree is greater than height of right subtree. c.Check whether height of right subtree is greater than height of left subtree. d.None of the others. Answer:Check whether binary tree is balanced.  
  
Question 100: a. b. c. d. Answer: Quiz Chapter 03 Question 1 Marks: 1 Which of the following operations are implemented in the ArrayList class belongs to the java.util package: Choose one answer. a. Update one element in any position in the ArrayList. b. Add one element to any position in the ArrayList. c. All of the others. d. Retrieve one element from any position in the ArrayList. Answer: All of the others. Question 2 Marks: 1 If an algorithm is constantly accessing only some elements such as the first, th e second, the last and the like, and if changing the structure is very important to the algorithm then solution is using: Choose one answer. a. Linked list. b. Array. c. None of the others Answer: Linked list. Question 3 Marks: 1 Select correct statement(s) about Doubly Linked List: Choose at least one answer. a. Deleting a node at the end of the list takes time O(1) . b. Methods for processing doubly linked list are simpler than those of s ingly linked list. c. Inserting a new node at the end of the list requires O( n ) steps. d. Processing for adding a node to the end of list includes six steps. Answer: Deleting a node O(1)+ Inserting a new node O( n ) Question 4 Marks: 1 The advantage of arrays over linked lists is that they allow random accessing. Answer: True Question 5 Marks: 1 Elements of a linked list must be consecutive memory cells. Answer: False Quiz Chapter 04 Question 1 Marks: 1 In the array implementation, enqueuing can be executed in constant time O(1) Answer: True Question 2 Marks: 1 Select false statement: Choose one answer. a. All of the others. b. In the array list implementation, popping is executed in constant tim e O(1). c. In the array list implementation, poping is executed in O(lgn) to the  
  
worst case. d. Stack can be implemented using linked list. Answer: In the array list implementation, poping is executed in O(lgn) to the wo rst case. Question 3 Marks: 1 Which of the following about queue are true: Choose one answer. a. A queue is a structure in which adding and removing elements only tak e place at one end. b. None of the others. c. A queue is an FIFO structure. d. A queue is a structure in which each end can be used for adding new e lements and removing them. Answer: A queue is an FIFO structure. Question 4 Marks: 1 In the array implementation, dequeuing can be executed in time O(n) Answer: False Question 5 Marks: 1 In the doubly linked list implementation, enqueuing can be executed in time O(n) Answer: False Quiz Chapter 05 Question 1 Marks: 1 Select incorrect statement: Choose one answer. a. Recursive definitions are frequently used to define functions and seq uences of numbers. b. None of the others c. Recursive definitions serve generating new elements and testing wheth er an element belongs to a set. d. The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed. Answer: The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed. Question 2 Marks: 1 Consider the following recursive function, assuming n is even: h(n)={1ifn=01+h(n-2)n>1 What is the value of h(20): Choose one answer. a. 9 b. 11 c. 12 d. 10 Answer: 11 Question 3 Marks: 1 When converting a method from a recursive version into an iterative version, Choose at least one answer. a. The program always runs slower. b. The brevity of program formulation lost. However, the brevity may not be an issue in Java. c. Program clarity can be diminished. d. The brevity of program formulation lost. Answer: Program clarity+the brevity of program formulation lost Question 4  
  
Marks: 1 In all cases, nonrecursive implementation is faster than recursive implementatio n. Answer: False Question 5 Marks: 1 Which of the following statements are true: Choose at least one answer. a. The recursive version increases program readability, improves self-do cumentation and simplifies coding. b. The return address is address of the caller's instruction immediately following the call. c. In the most cases, the code of nonrecursive implementation is shorter than it is in the recursive implementation. d. Global variables are stored in activation record. Answer: The recursive version increases + The return address is address Quiz Chapter 06 Question 1 Marks: 1 Which of the following statements about heap are false: Choose one answer. a. Heap represented by array can be traversed easily in depth-first. b. Heaps can be implemented by arrays. c. John Williams's algorithm uses top-down method which extends the heap by enqueuing new elements in the heap. d. Floyd's algorithm uses bottom-up method which merges repetitively sma ll heaps into larger heaps. Answer: Heap represented by array can be traversed easily in depth-first. Question 2 Marks: 1 Which of the following statements are true: Choose at least one answer. a. Preorder, inorder and postorder tree traversal generate unambiguous o utputs. b. Expression trees do not use parentheses. c. Polish notation is only applied for compilers. d. In a expression tree, leaves are operators and nonterminal nodes are operands and. e. Polish notation eliminates all parentheses from formulas. Answer: Polish notation eliminates all parentheses from formulas.+ Expression tr ees do not use parentheses. Question 3 Marks: 1 Which operation is used in DSW Algorithm: Choose one answer. a. Rotation b. None of the others c. All of the others d. Sorting Answer: Rotation Question 4 Marks: 1 Which of the following methods are used to traverse a tree without using any sta ck or threads: Choose one answer. a. None of the others b. Traversal through Tree Transformation c. Recursion Answer: Traversal through Tree Transformation  
  
Question 5 Marks: 1 Which of the following concepts of binary tree are true: Choose one answer. a. The level of a node must be between 1 and height of the tree. b. The level of a node is the length of the path from the root to the no de plus 1. c. The height of a nonempty tree is the maximum level of a node in the t ree. d. All of the others Answer: All of the others Quiz Chapter 08 Question 1 Marks: 1 Which graph representation is best? Choose one answer. a. It depends on the problem. b. Adjacency matrix c. Incidence matrix d. Adjacency list e. None of the others. Answer: It depends on the problem. Question 2 Marks: 1 Which of the following statements about finding the shortest path are true: Choose one answer. a. The complexity of Dijkstra's algorithm is O(|V|2) b. Ford's algorithm relies on label-setting method. c. The complexity of Ford's algorithm is O(|V||E|) for any graph. d. The complexity of Dijkstra's algorithm using heap is O(|V|ln|V|) Answer: The complexity of Dijkstra's algorithm is O(|V|2) Question 3 Marks: 1 Which of the following sentences are true: Choose at least one answer. a. The complexity of DFS for graph traveral is O(|V|+|E|) . b. The complexity of DFS for graph traversal is (O|V|lg|V|) if an adjace ncy matrix is used c. To prevent loop from happen in an algorithm for traversing a graph, e ach visited vertex can be marked. d. All algorithms are more efficient if the underlying graph traversal i s not BFS but DFS. Answer: DFS O(|V|+|E|) + prevent loop from happen in an algorithm for traversin g a graph, each visited vertex can be marked. Question 4 Marks: 1 Which of the following statements about graph coloring is true: Choose at least one answer. a. In sequential coloring algorithm, vertices must be ordered according to indices already to the vertices. b. The complexity of sequential Coloring algorithm is O(|V|2) . c. In sequential coloring algorithm, vertices must be ordered according to degree of vertices. d. Sequential Coloring algorithm establishes the sequence of vertices an d a sequence of color before coloring them. Answer: Coloring algorithm is O(|V|2) + the sequence of vertices and a sequence of color before coloring them. Question 5 Marks: 1  
  
Most of the label-setting and label-correcting methods are used to find the shor test paths from one vertex to all other vertices. Answer: True Quiz Chapter 09 Question 1 Marks: 1 Which of the following statements about efficient sorting is true: Choose at least one answer. a. Only insertion sort is apllied in all h-sorts of shell sort. b. There is no which sequence of increments is optimal. c. Shell sort is more efficient than insertion sort even if in case ther e are only two increments. d. Shell sort divides physically the original array into subarrays and s orts them separately. Answer: divides physically+Only insertion sort Question 2 Marks: 1 Which of the following statements about elementary sorting is true: Choose one answer. a. All of others. b. Advantage of using insertion sort is that it sorts the array only whe n is really necessary. c. In the worst case of bubble sort, number of swaps is n(n-1)4 Answer: Advantage of using insertion sort is that it sorts the array only when i s really necessary. Question 3 Marks: 1 Select correct statements about Radix sort: Choose at least one answer. a. bitRadixsort() is faster than radixsort(). b. bitRadixsort() can be improved by implementing array instead of using queue. c. Radix sort is used only for string sorting. d. One of techniques radix sort uses is by looking at each number as a s tring of bits so that all integers are of equal length. Answer: bitRadixsort() array instead of using queue. + by looking at each number as a string of bits Question 4 Marks: 1 In Insertion sort, which case is only one comparison made for each position i: Choose one answer. a. The data are in reverse order b. None of the others. c. The data are in random order. d. The data are already in order. Answer: The data are already in order. Question 5 Marks: 1 Consider Insertion sort algorithm for a n-element array. The number of times var iable tmp is loaded and unloaded in the outer for loop is: Choose one answer. a. 2(n-1) in the best case. b. 2(n-1) in the worst case. x c. All of the others. Answer: All of the others. Quiz Chapter 10 Question 1 Marks: 1  
  
Which of the following statement about Perfect Hash Functions are true: Choose at least one answer. a. The searching process in Cichelli's algorithm is linear. b. Cichelli's algorithm guarantees that a perfect hash function can be f ound. c. Cichelli's method uses an exhaustive search. d. Cichelli's method is used to hash relatively small number of reserved words. Answer: exhaustive search.+hash relatively Question 2 Marks: 1 Which of the following statement is true: Choose one answer. a. To create a hash function, the hashing table has to contain at least the same number of positions as the number of elements being hashed. b. If hash function transforms different keys into different numbers, it is called a perfect hash function. c. All of the others. Answer: All of the others. Question 3 Marks: 1 Select correct statements: Choose at least one answer. a. In shift folding method, the key is usually divided into even parts o f some fixed size plus some remainder and added. b. The shift folding method can be applied to string data. c. In boundary folding method, the key is usually divided into even part s of not fixed size plus some remainder and added. d. The boundary folding method can not be applied to string data. Answer: shift ,plus some remainder and added+ boundary , can not be applied to s tring data. Question 4 Marks: 1 Which of the following statement about Open Addressing are false: Choose at least one answer. a. In linear probing of the open addressing method, the position in whic h key can be stored is found by sequentially searching starting from the begin o f table. b. Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup. c. For quadratic probing, the size of table should not be an even number . d. Linear probing has a tendency to create clusters in the table. Answer: In linear probing of the open addressing+ Using quadratic probing Question 5 Marks: 1 Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. Answer: True Quiz Chapter 11 Question 1 Marks: 1 The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol mi; that is, if P(mi)=P(mj), then L(m i)=L(mj) for 1=i, j=n Answer: False Question 2 Marks: 1  
  
In data compression, no special punctuation is required to separate two codeword s in a coded message. Answer: True Question 3 Marks: 1 Select correct statement about Ziv-Lempel Code. Choose one answer. a. Ziv-Lempel Code uses buffer of symbols. b. All of the others. c. The codeword of Ziv-Lempel Code is a triple. Answer: All of the others. Question 4 Marks: 1 Which of the following data structure can be used to implement Huffman Coding Choose at least one answer. a. Heap. b. Doubly linked list. c. Binary tree. d. Stack list. e. Queue. Answer: Heap + Doubly linked list + Binary tree. Question 5 Marks: 1 Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique. Answer: True Q1 Which statements are true about inheritance? Answer: In Java the extends clause is used to specify inheritance Q2 Which statements are true about interfaces? Answer: Interfaces can extend any number of other interfaces. Q3 Which one of these for statements is valid Answer: for (int i=0, j=100; i  
   
Answer: None of the others. Q10 In the array version of the Queue, which operations require O(n) time for th eir worst-case behavior? Answer: None of the others Which of the following applications may use a stack? Answer: All of the others. In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? Answer: None of the others When a method call is executed, which information is not saved in the activation record? Answer: Current depth of recursion. When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? Answer: None of the others. Select the one TRUE statement. Every binary tree is either balanced or perfect balanced. Every balanced binary tree is also a perfect balanced binary tree. Every perfect balanced binary tree is also a balanced binary tree. No binary tree is both balanced and perfect balanced. Answer: Every perfect balanced binary tree is also a balanced binary tree.  
  
is visiting node starting from the highest (or lowest) level and moving down (or up el by level, visiting nodes on each level from left to right (or from right to l eft). Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. Answer: DSW Algorithm A heap is an exellent way to implement a Answer: priority queue ..  
  
What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exams at the same time by applying Answer: Graph coloring  
  
What is the worst-case time for mergesort to sort an array of n elements? Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? Answer: O(n2) What is the worst-case time for heapsort to sort an array of n elements? Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? Answer: O(n) What is the worst-case time for binary search finding a single item in an array? Answer: Logarithmic time What is the best definition of a collision in a hash table? Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? Answer: m/s Which of the following data structure can be implement Huffman Coding Answer: All of the others Select incorrect statements about restrictions need to be imposed on the prospec tive codes: Answer: Each codeword may corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer: All of the others. What is written to the screen for the input "ABBAABBA"? Answer: ABBAABBA What values of number are directly handled by the stopping case? number < 0 number < 10 number >= 0 && number < 10 number > 10 Answer: number >= 0 && number < 10 Number of comparisons of keys and comparisons of i and least is: Answer: ((n-1)(n+2))/2 Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. What is outpu t after iteration i=4 of the outer for loop completed Answer: 1, 2, 3, 4, 5, 7, 6 Number of comparisons of keys is Answer: n\*(n-1)/2 Which traversal does the above algorithm implement? Breadth-first traversal Inorder tree traversal  
  
Postorder tree traversal Preorder tree traversal Answer: Preorder Select correct statements when applying this algorithm to a n-element array: moveDown() is called times to create the heap in the first phase. The heap is restored times in the second phase. In the second phase, this algorithm exchanges times the root with the element i n position. All of the others. Answer: All of the others. How many asterisks are printed by the method call quiz(5)? Answer: 7 What is output if this algorithm is executed on the following binary tree: 40 30 7 10 11 3 1 2 14 1 3 2 7 10 40 30 11 14 1 2 3 14 7 10 11 40 30 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 3 9 5 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception? x = y; z = x; y = (B) x; z = (C) y; y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same package as the class of the method. How can such a restriction be enforce d? Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? \_class $value$ zer@ Angs\_trom Answer: zer@ Which statement concerning the switch construct is true? All switch statements must have a default label. A character literal can be used as a value for a case label The keyword continue can never occur within the body of a switch statement. All of the others. Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: new Integer(str)).intValue()  
  
Select correct statements about a singly linked list. Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list. All of the others None of the others. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list. A new node can be inserted into any position, except first position, without any traversal. Deleting a node at the beginning of a list involves setting head to point to hea d.next. All of the others. None of the others. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Properties of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong statements: Recursion is always more efficient than loops. Recursion can make the conceptual design of an algorithm s implementation easier. Recursion gone wrong can lead to overflow stack errors Recursion can be only replaced by iteration. Answer: is always more efficient than loops+ can be only replaced by iteration In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: Answer: Recursion Consider algorithm of the 8-queen problem: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes?  
  
Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: Right + Left rotation. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements: Djikstra's shortest path algorithm can be applied to undirected graph. The breadth-first search can be used to find the shortest path from a source ver tex to the destination vertex All of the others. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? Answer: Kruskal + Dijkstra algorithm. Which of the following statements about shortest path finding algorithms are tru e: Dijkstra s algorithm is label-setting algorithm. Dijkstra s algorithm can be applied to graphs have negative weights. The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertices of graph. All of the others. Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: Answer: All of the others. The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution:  
  
Answer: Open addressing. Which of the following hashing methods can cause collision: Answer: All of the others. Select incorrect statements: Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. Answer: True Select incorrect statements about Data compression: a Huffman tree can be only constructed bottom-up. b In adaptive Huffman encoding, sibling property is retained assures the H uffman tree under construction is still a Huffman tree. c All of the others. d None of the others. Answer: Huffman tree can be only constructed bottom-up. Which expressions will evaluate to true if preceded by the following code? (a == "Hello") (a == b) (a == c) a.equals(b) Answer: (a == c)+a.equals(b) What is output when calling TriangularNumber(4) Answer: 10 What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10 Answer: 11 What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? Answer: 5 What is maximum number of elements in queue when traversing the below tree using  
  
the above algorithm? Answer: 4 Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop. Answer: {15,12,6,11,10,2,3,1,8} In the first loop, moveDown is called n/2 times in any case. The total number of moves in all executions of moveDown in the second phase is O (lgn). All of the others. None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. this is g of A this is g of C An error occurs when compiling the program. Nothing is printed. Answer: this is g of C Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. Answer: {3,4,8,10,12,17,5,14,13} How many times is number 840 printed out when call pattern(840) Answer: 2 How many integers will the program print when calling nonTail(n), n > 0. Answer: 2^n -1 Count number of even values in binary tree. Print even numbers in binary tree. Print even numbers in ascending order. Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Count number of nodes in binary tree. Calculate height of binary tree. Count number of nonterminal nodes in binary tree. None of the others Answer: Calculate height of binary tree. Check whether binary tree is balanced. Check whether height of left subtree is greater than height of right subtree. Check whether height of right subtree is greater than height of left subtree. None of the others. Answer: Check whether binary tree is balanced.  
  
Select incorrect statements about Object Oriented Programming: Static methods and variables are associated with the class it self and are called instance methods and instance variables The combination of data and related operations is called information hiding principle. Answer: Static methods and variables+ The combination of data Which of the following keywords are access modifier: Answer: protected + private  
  
Select correct statements: a. A derived class can override the definition of a final method by introducing its own definition t. In an abstract class, methods are only declared but not defined c. Subclasses or derived classes inherit the fields and methods from their base class. d. An abstract data type can be part of a program in the form of an interface Answer: Subclasses or derived classes inherit+ An abstract data type An object can be saved in a file if its class type is stated toimplement the Ser ializable interface, d. If the vector s capacity is greater than its size, then anew element can be inserted at the end of the vector immediately. Answer: An object + If the vector s capacity Which of sentences about singly linked list are true: Answer: begin O(1)+ average O(n)+ is no immediate a. Methods for processing doubly linked list are simpler than those of singly linked list b. The node which is deleted from the list will be claimed by the garbage collector. c Deleting a node at the end of the list takes constant time 0(1). d. Inserting a new node at the end of the list requires 0 ( n) steps. Answer: The node which is deleted+ Deleting a node at the end Select incorrect statement about skip list: Answer: None of the others. Select incorrect statement about skip list: The search time is O (ign) in the worst case. Answer: search time is O (ign)+20 element Select false statement: Stack can be implemented using linked list. Stack is applied to Java Virtual Machine, In the array list, poping is executed in O (lgn) to the worst case. In the array list, popping is executed in constant time 0(1) Answer: poping is executed in O (lgn) to the worst case. a. The Java implementation of the stack is potentially fatal. b. pop () method returns copy of the top element in the stack c. peek () method removes the top element of the stack and return it. d. Stack can be implemented by linked list. Answer: The Java implementation+ Stack can be implemented by linked list Which of the following can be executed in constant time 0 ( n) Answer: deleting singly linked list average case +worst case. Which of the following statements are true: Local variables must be stored in activation recordt. the return address is address of the caller s instruction immediately foil owing t he c al 1. Answer: all-in the most case When converting a method from a recursive version into an iterative version, Answer: The brevity not be lost + diminished  
  
Recursive definitions on most computers are eventually implemented using a run t ime stack and this implementation is done by the operating system. Answer: True In all cases, nonrecursive implementation is faster recursive implementation. Answer: False Which of the following concepts of tree are true: Answer: all -path is number of arcs Select correct statement: A search can takes 1g ( n) time units in the worst case. Answer: all-A search lg ( n)worst case.+ for a binary tree Select incorrect statement: Depth-first traversal can be implemented using stack. Depth-first traversal can not be implemented if not using stack A recursive implementation of preorder free traversal uses stack p1icitly. There are six possible ordered depth-first traversals. Morris s algorithm does not temporarily change free structure. Answer: all-DF stack+ morris Which of the following statements are true: a. Polish notation eliminates all parentheses from formulas b. Preorder, inorder and posorder tree traversal generate unambiguous outputs. Using Polish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order d. In a expression tree, leaves are operators and nonterninal nodes are operands. e. Expression trees do not use parentheses. f. Polish notation is only applied for compilers. Answer: parentheses +Using Polish+ Expression Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithmis O(VWEh for any graph. t. For label-correcting method, information of any label can be changed during application of method. c. Ford s algorithm relies on label -setting method. t The complexity of Dijkstra s algorithm using heap is O(VlnV) e. The complexity of Dijkstra s algorithm is o( v12) Answer: complexity Dijkstra s +complexity Dijkstra s + label-correcting Which of the following statement about spanning tree is false: a. The complexity of Kruskal s algorithm depends on the complexity of the sorting method applied t. The complexity of Kruskal s algorithm depends on the method used for cycle detection. c. All of the others. t None of the others. Answer: None of the others. Which of the following statements about efficient sorting is false: a. The worst case is when the bound divides an array into subarrays of approximately length b. In quick sort, a strategy for selecting a bound is to choose the element located in the middle of the array.  
  
c The best case of quick sort happens when bound is the largest (the smallest) element of the array. d. Quick sort is recursive in nature. Answer: n/2 + best case Which of the following statements is true; a. All the sorting methods implemented in java is applied to any basic data type. t. For objects comparison, a comparison criterion must be implemented by user for all classes. c All of others. t None of others. Answer: All of others. In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. Answer: false Which of the following statement are true: Linked list can be used in Bucket Addressing. In chaining, searches always fast if using linked lists. Answer: All-in chaining correct statements a. Extendible hashing is directoryless technique t. Extendible hashing is faster than and requires less space than Linear hashing. c. A reorganization of the file is avoided by using extendible hashing if the directory overflows. The characteristic feature of extendible hashing is the organization of the index, which is expandable table. e. Linear hashing is directory technique. Answer: reorganization + characteristic incorrect statements about Huffman Coding Answer: all-Huffman tree can be built top-down. correct statements about Run-length encoding. Answer: A serious drawback of run-length encoding is that it reliesentirely on the occurrences of runs Identify whether below code has error or not: Answer: Compile error. Identify whether below code has error or not: Answer: 3 Compile error. objectiprocess2 ( N ) calls process2 of class ExtC. object2.processl (1) does not issue compile error. object2.process3 ( N ) call process3 of class C. object3.process2( N ) call process2 of class C. Answer: all-object3.process2( N ) call process2 of class C. Identify which alogrithm the above code implements Insertion Sort Bubble Sort Selection Sort Radix Sort Answer: Insertion Sort  
  
Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is ABCDEF\n Answer: FEDCBA What is output if nontail is called with j = 3 Runtime error is issued 1213121 12321 21312 Answer: Runtime error is issued What is output if nontail is called with i = 5 1315131 13531 3135313 None of the others Answer: 1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: 1211181021563 28 112 11106153 2631581011112 12 1111082 1536 Answer: 2631581011112 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 1211181021563 28 112 11106153 263 15 81011112 121111082 1536 Answer: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 2863 15 10112 11 286110153 12 11 268 110 153 1112 2683 15 10 11112 Answer: 2683 15 10 11112 Assume that sort is executed with array {9,4,2,5,8,15,3}. What is output after iteration i=5 of the outer for loop completed Answer: {2,4,5,8,9,10,3) Assume that sort is executed with array {19,14,6,5,18,1,15}. What is output afte r iteration i=5 of the outer for loop completed Answer: { 19, 18, 14,6,5,10, 15) Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: There are some compile errors. There may be runtime error in some case.  
  
There always are runtime errors. No error. Answer: There may be runtime error in some case. Identify whether the code of pop method has error or not: Answer: There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string Â¡s ABCDEF\n t Answer: \nFEDCBA  
  
- Static methods and variables are associated with the class itself and are cal led instance methods and instance Answer:variables - The combination of data and related operations is called inf ormation hiding principle 2. Which of the following keywords are access modifier: Answer:- Protected - Private 3. Select correct statements: Answer:- Subclasses or derived classes inherit the fields and methods from thei r base class - An abstract data type can be part of a program in the form of an interface 4. Which of the following statements are true: Answer:- AN object can be saved in a life if its class type is stated to implem ent in the Serializable interface - If the vector s capacity is greater than its size, then a new element can be inserted at the end of the vector immediately 5. Which of sentences about singly linked list are true: Answer:- Deleting a node at the beginning of the list takes constant time O(1) - On the average, delete operation executes O(n) steps - There is no immediate access to the predecessor of any node in list 6. Select correct statement(s) about Doubly Answer:- The node which is deleted from the collection - Deleting a node at the end of Processing for adding a node to the end of Linked List: list will be claimed by the garbage the list takes constant time O(1) list includes six steps  
  
7. Select incorrect statements about skip list: Answer:- None of the others: + In a skip list of n nodes, for each k and I such that and , the node in position 2k-1 .i points to the node in position 2k-1 .(i+1) + The number of reference fields indicates the level of each node, and the numbe r of levels is maxLevel = 8. Select incorrect statement about skip list: Answer:- The search time is O(lgn) in the worst case - In 20-element skip list  
  
s, the node in position 3 points to the node in position 7 9. Select false statement: Answer:- In the array list, poping is executed in O(lgn) to the worst case 10. Select true statements about stack: Answer:- The Java implementation of the stack is potentially fatal - Stack can be implemented by linked list 11. Which of the following methods of queue are true: Answer:- isEmpty() Check to see if the queue is empty - enqueue(el) Put the el ement el at the end of the queue - firstEl() Return the first element in the qu eue without removing it 12. Which of the following can be executed in constant time O(n) Answer:- When deleting a node of a singly linked list in the average case - Wh en deleting a node of a singly linked list in the worst case 13. Which of the following statements are true: Answer:- The recursive version increases program readability, improves self-doc umentation and simplifies coding 14. When converting a method from a recursive version into an iterative version, Answer:- The brevity of program formulation lost. However, the brevity may not be an issue in Java - Program clarity can be diminished 15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system. Answer:- True 16. In all cases, nonrecursive implementation is faster recursive implementation . Answer:- False 17. Which of the following concepts of tree are true: Answer:- The height of a nonempty tree is the maximum level of a node in the tr ee - The level of a node is the length of the path from the root to the node pl us 1 - The level of a node must be between 1 and height of the tree 18. Select correct statement: Answer:- For a binary tree with n nodes, there are n! different traversals - T he complexity of searching depends on the shape of the tree and the position of the node in the tree - Breath-First traversal is implemented using queue 19. Select incorrect statement Answer:- Depth-first traversal can not be implemented if not using stack - A r ecursive implementation of preorder tree traversal uses stack explicitly - Ther e are six possible ordered depth-first traversal 20. Which of the Answer:- Polish sh notation, all erations and put eses following statements are true: notation eliminates all parentheses from formulas - Using Poli expressions have to be broken down unambiguous into separate op into their proper order. - Expression trees do not use parenth  
  
21. Which of the following sentences are true: Answer:- The complexity of DFS is O(|V| + |E|), where |V| is number of vertices and |E| is number of edges - To prevent loop from happen in an algorithm for t  
  
raversing a graph, each visited vertex can be marked 22. Which of the following statements about finding the shortest path are true: Answer:- For label-correcting method, information of any label can be changed d uring application of method - The complexity of Dijkstra s algorithm is O(|V| The complexity of Ford s algorithm is O(|V||E|) for any graph 23. Which of the following statement about spanning tree is false: Answer:- None of the others: + The complexity of Kruskal s algorithm depends on t he complexity of the sorting method applied + The complexity of Kruskal s algorithm depends on the method used cycle detection 24. Which of the following statements about graph coloring is true: Answer:- The complexity of sequential Coloring algorithm is O(|V|2- Sequential Coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them 25. Which of the following statements about efficient sorting is false: Answer:- Shell sort divides the original array into physical subarrays, sorting them separately, then merging and dividing them again to sort the new subarray until the whole array is sorted 26. Which of the following statements about efficient sorting is false: Answer:- The worst case is when the bound divides an array into subarrays of ap proximately length - The best case of quick sort happens when bound is the la rgest (the smallest) element of the array 27. Which of the following statements is true: Answer:- All of the others: + All the sorting methods implemented in Java is ap plied to any basic data type + For objects comparison, a comparison criterion mu st be implemented by user for all claases 28. In Insertion Sort, the number of movements and comparison for a randomly ord ered array is closer to the best case. Answer:- False 29. Which of the following statement about Open Addressing are false: Answer:- In linear probing of the open addressing method, the position in which key can be stored is found by sequentially searching starting from the begin of table - Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup 30. Which of the following statement are true: Answer:- Linked list can be used in Bucket Addressing - Self-organizing linked lists can be used improve performance in chaining - Coalesced hashing combines linear probing with chaining 31. Which of the following statement about Perfect Hash Functions are true: Answer:- Cichelli s method uses an exhaustive search - Cichelli s method is used t o hash relatively small number of reserved words 32. Select correct statements: Answer:- A reorganization of the file is avoided by using extendible hashing if the directory overflows - The characteristic feature of extendible hashing is the organization of the index, which is expandable table  
  
33. Which of the following data structure can be implemented Huffman Coding Answer:- Singly linked list - Priority queue - Doubly linked list 34. Select incorrect statements about Huffman Coding: Answer:- Huffman tree is only implemented by non-recursive algorithm - David H uffman s algorithm may not be useful for sending some specialized files - Adaptiv e Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter 35. Select correct statement about Run-length encoding. Answer:- A serious drawback of run-length encoding is that it relies entirely o n the occurrences of runs 36. Identify whether below code has error or not: Abstract class AC1{ Int AC1f1() {return 0;} Void AC1f2(int i) {return;} Int AC1f3(); } Answer:- Compile error 37. Identify whether below code has error or not: Interface I2{ Double I2f1(); Void I2f1(); Double I2f3() {return 10;} Int n = 10; Private double m; } Answer:- 3 compile errors 38. Class C{ Void process1(char ch)( .) Void process2(char ch)( .) Void process3(char ch)( .) } Class ExtC extends C{ Void process1(int n)() Void process2(char ch)() Void process4(int n)() } ExtC object1 = new ExtC(); C object2 = new ExtC(), object3 = new ExtC(); Which of the following statements are true Answer:- Object1.process2( N ) calls process2 of class ExtC - Object2.process1(1) does not issue compile error - Object2.process3( N ) call process3 of class C 39. For (int I = first, j; I <= last; i++) { Int tmp = data[i]; For (j=I; j>0 && tmp> void XYZsort (T[] data) {  
  
For (int i=0 ; iI; --j) If (data[j].compareTo(data[j-1])<0) Swap(data,j,j-1); } Identify which algorithm the above code implements Answer:- Bubble sort 41. Public static void reverse() { Char ch=getChar(); If(ch!= \n ) { Reverse(); System.out.print(ch); } } Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n 42. Void nontail(int i) { If(i>0) { Nontail(i+1); System.out.print(i+ ); Nontail(i+1); } } What is output if nontail is called with i=3 Answer:- Runtime error is issued 43. Void nontail(int i) { If(i>0) { Nontail(i-2); System.out.print(i+ ); Nontail(i-2); } } What is output if nontail is called with i=5 Answer:- 1315131 44. Protected void preorderVRL(BSTNode p) { If (p!=null { Visit(p); preorderVRL(p.right); preorderVRL(p.left); } } What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: Answer:- 2 6 3 15 8 10 1 11 12 45. What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: Answer:- 2 6 8 3 15 10 1 11 12  
  
46. Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer:- {2,4,5,8,9,10,3} 47. Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loo completed Answer:- {19,18,14,6,5,10,15} 48. Let deleteFromHead be method used to delete the first element of generic sin gly linked list class: Identify whether above code has error or not: Answer:- There may be runtime error in some case 49. Identify whether the code of pop method has error or not: Answer:- There may be runtime error in some case 50. Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n Answer:- \nFEDCBA 51. Which of the following about queue are true: Answer:- A queue is an FIFO structure 52. Which of the following statement of queue are true Answer:- All of the others: + Using array for queue implementation may not be t he best choice + A natural queue implementation is a linked list 53. Select false statement: Answer:- In the array list, poping is executed in time O(n) to the worst case 54. In the doubly linked list implementation, enqueuing can be executed in time O(n) Answer:- False 55. Which of the following statements about heap are false: Answer:- Heaps represented by array can be travered easily in depth-first - A heap can be defined as an array heap of length n in which: - Heaps can be imple mented by arrays 56. Consider below recursive define about tree: 1. An empty structure is an empty tree. Answer:- True 57. Which of the following statements about elementary sorting is true: Answer:- None of the others + In selection sort, for every iteration j of the i nner for loop, there are n-i+1 comparisons + The worst case of selection sort ha s n-1 swap calls 58. Which of the following statements about efficient sorting is true: Answer:- Insertion sort is applied to small portions of an array to improve per  
  
formance - Mergesort can be made more efficient by replacing recursion with ite ration 59. Select correct statements about Radix sort: Answer:- bitRadixsort() can be improved by implementing array instead of using queue - One of techniques radix sort uses is by looking at each number as a str ing os bits so that all integers are of equal length. 60. Which of the following statement is true: Answer:- If hash function transforms different keys into different numbers, it is called a perfect hash function 61. Select correct statements: Answer:- In shift folding method, the key is usually divided into even parts of some fixed size plus some remainder and added - The boundary folding method is applied to number data 62. Which of the following statements are false: Answer:- The best value of divisor can be any - The folding method is the pref erred choice for the hash function if very little is known about the keys 63. Each codeword corresponds to one or more symbols Answer:- False 64. Run-length encoding is very efficient for text file in which only blank char acter has a tendency to be repeated without using any technique Answer:- True 65. Select correct statement about Ziv-Lempel Code Answer:- All of the others: + Ziv-Lempel Code uses buffer of symbols + The code word of Ziv-Lempel Code is a triple 66. The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol m; that is, if then for Answer:- False 67. In the array implementation, enqueuing can be executed in constant time O(1) Answer:- True 68. Which of the following about stack are true: Answer:- The most top element is the latest added element - Operations of stac k based on Last in First out structure 69. In the array implementation, dequeuing can be executed in O(n) Answer:- False 70. Which of the following about queue are true: Answer:- A queue is an FIFO structure 71. Select incorrect statement: Answer:- The anchor or ground case allows for the construction of new objects o ut of basic elements or objects that have already been constructed 72. What is the value of h(1): Answer:- 14  
  
73. What is the value of A(3,1): Answer:- 15 74. In all binary trees, there are 2i nodes at level i. Answer:- False 75. Which of the following methods are used to traverse a tree without using any stack or threads: Answer:- Traversal through tree Transformation 76. Which operation is used in DSW Algorithm: Answer:- Rotation 77. Which of the following are false: Answer:- A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) edges( vn-1vn) and no edge is represented - A circuit is a cycle in which all vertices must be different 78. Which graph representation is best? Answer:- It depends on the problem 79. Which of the following statements about finding shortest path are true: Answer:- For label-setting methods, in each pass through the vertices still to be processed, one vertex is set to a value that remains unchanged to the end of the execution - The methods solving the shortest path problem are divided into classes; label-setting and label-correcting 80. Which of the following statements about graph coloring is true: Answer:- Sequential coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them. - The complexity of sequential Color ing algorithm is O(|V| 2 ) 81. Which of the following statement about finding the shortest path is false: Answer:- The complexity of WFI s algorithm is |V| 3 that is good efficiency for any graph 82. In insertion sort algorithm, the number of times variables tmp is loaded and unloaded in the outer for loop is not: Answer:- All of the others: + Necessary in the worst case + Redundant in the be st case 83. Which of the following statements about Quick sort is true: Answer:- Quick sort is recursive in nature - A strategy for selecting a bound is to choose the element located in the middle of the array 84. Skip list helps avoiding sequential search Answer:- True 85. Select correct statement(s): - A singly linked list is a nod e that has a link only to its successor in this sequence - Inserting a new node at the end of the singly linked list without tail field requires steps with n i s the number of nodes 86. Which of the following operations are implemented in the LinkedList class be longs to the java.util package:  
  
Answer:- All of the others: + Return the copy of the linked list without clonin g its elements + Add all the elements from one collection to the beginning of th e linked list 87. Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are managed by the heads and tails. The complexity of direct concatenating L2 to L1 is Answer:- O(1) 88. Which of the following operations are not implemented in the ArrayList class belongs to the java.util package: Answer:- None of the others: + Remove the object at given position + Copy all o bjects from the array list to a newly created array 89. Elements of a linked list must be consecutive memory cells Answer:- False 90. If an algorithm is constantly accessing only some elements such as the first , the second, the last and the like, and if changing the structure is very important to the algorithm then solution is us ing: Answer:- Linked list 91. The advantages of array over linked lists is that they allow random accessin g Answer:- True 92. Which of the following operations are implemented in the ArrayList class bel ongs to the java.util package: Answer:- All of the others: + Update one element in any position in the ArrayLi st + Add one element to any position in the ArrayList + Retrieve one element fro m any position in the ArrayList 93. Linked lists allow easy insertion and deletion of information because such o perations have a local impact on the list Answer:- True 94. In the doubly linked list implementation, dequeuing can be executed in const ant time O(1) Answer:- True 95. Which of the following methods of queue are true: Answer:- Enqueue(el) Put the element el at the end of the queue - Dequeue() ke the first element from the queue 96. Consider the following recursive function, assuming n is even: What is the value of h(20): Answer:- 11 97. Which of the following statements are false: Answer:- An activation record still exists after a method owning it ends - An activation record contains code of method owning it 98. Which of the following statements about graph coloring is true: 99. Most of the label-setting and label-correcting are used to find the shortest paths from one vertex to all other vertices Answer:- False Ta  
  
100. Which of the following statements about Perfect Hash Functions are true: Answer:- In a minimal perfect hash function, wasting time for collision resolut ion and wasting space for unused table cells are avoided - The functioning in H CD algorithm is found in three steps: mapping, ordering and searching 101. Hash function is function that can transform a particular key (K) (a strin g, number or record) into an index in the table used for storing items of the same type as K. Answer:- True 102. Entropy of source M is defined by: Answer:- false 103. Which of the following operations are not implemented in the ArrayList cla ss belongs to the java.util package: Answer:- Return the sub list of the array list containing copy of elements in t he array list 104. Insertion sort which case is only one comparison made for each position i: Answer:- The data are already in order 105. What are number of additions and number of calls to find Fib(8) using recu rsive definition Answer:- 33 and 67 106. Which of the following statements about Quick sort is true: Answer:- A strategy for selecting a bound is to choose the element located in t he middle of the array - Quick sort is recursive in nature 107. Which of the following statements about elementary sorting is true Answer:- Advantage of using insertion ort that it sorts the array only when is really necessary 108. Select correct Answer:- The middle tracted using a mask is more efficient to statements: part of the bit representation of the square of a key is ex and a shift operation- In practice, the mid-square method the size of table that is a power of 2  
  
Which of the following keywords are access modifier: answer: Protected + Private Select correct statements: answer:1.Subclasses or derived classes inherit the fields and methods from their base class 2.An abstract data type can be part of a program in the form of an interface Which of the following statements are true: answer:1.AN object can be saved in a life if its class type is stated to impleme nt in the Serializable interface 2.If the vector s capacity is greater than its s ize, then a new element can be inserted at the end of the vector immediately Which of sentences about singly linked list are true: answer:1.Deleting a node at the beginning of the list takes constant time O(1) 2.On the average, delete operation executes O(n) steps 3.There is no immediate access to the predecessor of any node in list Select correct statements about Doubly Linked List: answer:1.The node which is deleted from the list will be claimed by the garbage collection 2.Deleting a node at the end of the list takes constant time O(1) 3 .Processing for adding a node to the end of list includes six steps  
  
Select incorrect statements about skip list: answer:none of the others Select incorrect statement about skip list: answer:1.The search time is O(lgn) in the worst case 2.In 20-element skip lists , the node in position 3 points to the node in position 7 Select false statement: answer:In the array list, poping is executed in O(lgn) to the worst case Select true statements about stack: answer:1.The Java implementation of the stack is potentially fatal 2.Stack can be implemented by linked list Which of the following methods of queue are true: answer:1.isEmpty() - Check to see if the queue is empty 2.enqueue(el) - Put the element el at the end of the queue 3.firstEl() - Return the first element in t he queue without removing it Which of the following can be executed in constant time O(n) answer:1.When deleting a node of a singly linked list in the average case 2.Whe n deleting a node of a singly linked list in the worst case Which of the following statements are true: answer:The recursive version increases program readability, improves self-docume ntation and simplifies coding When converting a method from a recursive version into an iterative version: answer:1.The brevity of program formulation lost. However, the brevity may not b e an issue in Java 2.Program clarity can be diminished Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. answer:True In all cases, nonrecursive implementation is faster recursive implementation. answer:False Which of the following concepts of tree are true: answer:1.The height of a nonempty tree is the maximum level of a node in the tre e 2.The level of a node is the length of the path from the root to the node plu s 1 3.The level of a node must be between 1 and height of the tree Select correct statement: answer:1.For a binary tree with n nodes, there are n! different traversals 2.Th e complexity of searching depends on the shape of the tree and the position of t he node in the tree 3.Breath-First traversal is implemented using queue Select incorrect statement: answer:1.Depth-first traversal can not be implemented if not using stack 2.A re cursive implementation of preorder tree traversal uses stack explicitly 3.There are six possible ordered depth-first traversal Which of the following statements are true: answer:1.Polish notation eliminates all parentheses from formulas 2.Using Polis h notation, all expressions have to be broken down unambiguous into separate ope rations and p into their proper order. 3.Expression trees do not use parenthese s Which of the following sentences are true: answer:1.The complexity of DFS is O(|V| + |E|), where |V| is number of vertices and |E| is number of edges 2.To prevent loop from happen in an algorithm for tr aversing a graph, each visited vertex can be marked Which of the following statements about finding the shortest path are true: answer:1.For label-correcting method, information of any label can be changed du ring application of method 2.The complexity of Dijkstra s algorithm is O(|V|2) 3 .The complexity of Ford s algorithm is O(|V||E|) for any graph Which of the following statement about spanning tree is false: answer:none of the others Which of the following statements about graph coloring is true: answer:1.The complexity of sequential Coloring algorithm is O(|V|2) 2.Sequenti al Coloring algorithm establishes the sequence of vertices and a sequence of col or before coloring them Which of the following statements about efficient sorting is false:  
  
answer:Shell sort divides the original array into physical subarrays, sorting th em separately, then merging and dividi them again to sort the new subarray until the whole array is sorted Which of the following statements about efficient sorting is false: answer:1.The worst case is when the bound divides an array into subarrays of app roximately length n/2 2.The best case of quick sort happens when bound is the l argest (the smallest) element of the array Which of the following statements is true: answer:All of the others In Insertion Sort, the number of movements and comparison for a randomly ordered array is closer to the best case. answer:False Which of the following statement about Open Addressing are false: answer:1.In linear probing of the open addressing method, the position in which key can be stored is found by sequentially searching starting from the begin of table 2.Using quadratic probing gives much better results than linear probing a nd avoids the problem Which of the following statement are true: answer:1.Linked list can be used in Bucket Addressing 2.Self-organizing linked lists can be used improve performance in chaining 3.Coalesced hashing combines linear probing with chaining Which of the following statement about Perfect Hash Functions are true: answer:1.Cichelli s method uses an exhaustive search 2.Cichelli s method is used to hash relatively small number of reserved words Select correct statements: answer:1.A reorganization of the file is avoided by using extendible hashing if the directory overflows 2.The characteristic feature of extendible hashing is t he organization of the index, which is expandable table Which of the following data structure can be implemented Huffman Coding answer:1.Singly linked list 2.Priority queue 3.Doubly linked list Select incorrect statements about Huffman Coding: answer:1.Huffman tree is only implemented by non-recursive algorithm 2.David Hu ffman s algorithm may not be useful for sending some specialized files 3.Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter Select correct statement about Run-length encoding. answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs Identify whether below code has error or not: answer:Abstract class AC1{ Int AC1f1() {return 0;} Void AC1f2(int i) {return;} I nt AC1f3(); } Compile error Identify whether below code has error or not: answer:Interface I2{ Void I2f1(); Double I2f3() {return 10;} Int n = 10; Private double m;}-3 compile errors Which of the following statements are true answer:1.Object1.process2( N ) calls process2 of class ExtC 2.Object2.process1(1) d oes not issue compile error 3.Object2.process3( N ) call process3 of class C Identify which algorithm the above code implements answer:For (int I = first, j; I <= last; i++) { - Insertion Sort Identify which algorithm the above code implements answer:Public > void XYZsort (T[] data) - Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n answer:FEDCBA What is output if nontail is called with i=3 answer:Runtime error is issued What is output if nontail is called with i=5 answer:1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo  
  
llowing image: answer:2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: answer:2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for lo completed answer:19,18,14,6,5,10,15 Let deleteFromHead be method used to delete the first element of generic singly linked list class: answer:There may be runtime error in some case Identify whether the code of pop method has error or not: answer:There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n answer:\nFEDCBA Which of the following about queue are true: answer:A queue is an FIFO structure Which of the following statement of queue are true answer:All of the others Select false statement: answer:In the array list, poping is executed in time O(n) to the worst case In the doubly linked list implementation, enqueuing can be executed in time O(n) answer:False Which of the following statements about heap are false: answer:1.Heaps represented by array can be travered easily in depth-first 2.A h eap can be defined as an array heap of length n in which: 3.Heaps can be implem ented by arrays Consider below recursive define about tree: 1.An empty structure is an empty tre e. answer:True Which of the following statements about elementary sorting is true: answer:None of the others Which of the following statements about efficient sorting is true: answer:1.bitRadixsort() can be improved by implementing array instead of using q ueue 2.One of techniques radix sort uses is by looking at each number as a stri ng os bits so that all integers are of equal length. Which of the following statement is true: answer:If hash function transforms different keys into different numbers, it is called a perfect hash function Select correct statements: answer:1.In shift folding method, the key is usually divided into even parts of some fixed size plus some remainder an added 2.The boundary folding method is a pplied to number data Which of the following statements are false: answer:1.The best value of divisor can be any 2.The folding method is the pref erred choice for the hash function if very little is known about the keys Each codeword corresponds to one or more symbols answer:False Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique answer:True Select correct statement about Ziv-Lempel Code answer:All of the others The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol m; that is, answer:False  
  
In the array implementation, enqueuing can be executed in constant time O(1) answer:True Which of the following about stack are true: answer:1.The most top element is the latest added element 2.Operations of stack based on Last in First out structure In the array implementation, dequeuing can be executed in O(n) answer:False Which of the following about queue are true: answer:A queue is an FIFO structure Select incorrect statement: answer:The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed What is the value of h(1): answer:14 What is the value of A(3,1): answer:15 In all binary trees, there are 2i nodes at level i. answer:False Which of the following methods are used to traverse a tree without using any sta ck or threads: answer:Traversal through tree Transformation Which operation is used in DSW Algorithm: answer:Rotation Which of the following are false: answer:1.A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) edges(v n-1vn) and no edge is represented 2.A circuit is a cycle in which all vertices must be different Which graph representation is best? answer:It depends on the problem Which of the following statements about finding shortest path are true: answer:1.For label-setting methods, in each pass through the vertices still to b e processed, one vertex is set to a value that remains unchanged to the end of t he execution 2.The methods solving the shortest path problem are divided into c lasses; label-setting and label-correcting Which of the following statements about graph coloring is true: answer:1.Sequential coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them. 2.The complexity of sequential Colori ng algorithm is O(|V|2) Which of the following statement about finding the shortest path is false: answer:The complexity of WFI s algorithm is |V|3 that is good efficiency for any g raph In insertion sort algorithm, the number of times variables tmp is loaded and unl oaded in the outer for loop is not: answer:All of the others Which of the following statements about Quick sort is true: answer:1.Quick sort is recursive in nature 2.A strategy for selecting a bound i s to choose the element located in the middle of the array Select correct statement(s): answer:1.A singly linked list is a node that has a link only to its successor in this sequence 2.Inserting a new node at the end of the singly linked list with out tail field requires steps with n is the number o nodes Which of the following operations are implemented in the LinkedList class belong s to the java.util package: answer:All of the others Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are man aged by the heads and tails. complexity of direct concatenating L2 to L1 is answer:O(1) Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package: answer:None of the others  
  
Elements of a linked list must be consecutive memory cells answer:False If an algorithm is constantly accessing only some elements such as the first, th e second, the last and the like, a if changing the structure is very important t o the algorithm then solution is using: answer:Linked list The advantages of array over linked lists is that they allow random accessing answer:True Which of the following operations are implemented in the ArrayList class belongs to the java.util package: answer:All of the others Linked lists allow easy insertion and deletion of information because such opera tions have a local impact on the answer:True In the doubly linked list implementation, dequeuing can be executed in constant time O(1) answer:True Which of the following methods of queue are true: answer:1.Enqueue(el) - Put the element el at the end of the queue 2.Dequeue() Take the first element from the queue What is the value of h(20): answer:11 Which of the following statements are false: answer:1.An activation record still exists after a method owning it ends 2.An a ctivation record contains code of method owning it Most of the label-setting and label-correcting are used to find the shortest pat hs from one vertex to all other vertices answer:False Which of the following statements about Perfect Hash Functions are true: answer:1.In a minimal perfect hash function, wasting time for collision resoluti on and wasting space for unused table cells are avoided 2.The functioning in HC D algorithm is found in three steps: mapping, ordering and searching Hash function is function that can transform a particular key (K) (a string, num ber or record) into an inde the table used for storing items of the same type as K. answer:True Entropy of source M is defined by: answer:False Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package: answer:Return the sub list of the array list containing copy of elements in the array list Insertion sort which case is only one comparison made for each position i: answer:The data are already in order What are number of additions and number of calls to find Fib(8) using recursive definition answer:33 and 67 Which of the following statements about Quick sort is true: answer:1.A strategy for selecting a bound is to choose the element located in th e middle of the array 2.Quick sort is recursive in nature Which of the following statements about elementary sorting is true answer:Advantage of using insertion ort that it sorts the array only when is rea lly necessary Select correct statements: answer:1.The middle part of the bit representation of the square of a key is ext racted using a mask and a shift operation 2.In practice, the mid-square method is more efficient to the size of table that is a power of 2 Oriented Programming: Select incorrect statements about Object Static methods and variables are associated with the class itself and are called  
  
instance methods and instance variables. The combination of data and related operations is called information hiding prin ciple. Which of the following keywords are access modifier: private / protected Select correct statements: Subclasses or derived classes inherit the fields and methods from their base cla ss. An abstract data type can be part of a program in the form of an interface. Which of following statements are true: An object can be saved in a file if its class type is stated to implement the Se rializable interface. If the vector s capacity is greater than its size, then a new element can be inser ted at the end of the vector immediately. Select true statement(s) about Java. Variable names are strings of any length of letters, digits, underscores, and do llar signs For a postfix operator, autoincrement (or autodecrement) is the last operation p erformed Characters are 16 bits long x = 7; y = 4 \* ++x; z = 5 \* x--; what are the values of x, y, z after executing the above three statements? x = 7, y = 32, z = 40 What kind of methods of a class can be called by methods which is belong to anot her class? public methods Can two different classes contain methods with the same name? Yes, this is always allowed. What is the primary purpose of a constructor? To initialize each object as it is declared. Select correct statement. In Java, the extends clause is used to specify inheritance Select correct statement. Interfaces can extend any number of other interfaces. Select correct Java statement. for (int i=0, j=100; i < j; i++, --j) {;} Select incorrect statement. In java, ...... The default modifier means that a method or a field is accessible to derived cla sses. Which of sentences about singly linked list are true: There is no immediate access to the predecessor of any node in list. On the average, delete operation executes O ( n ) steps. Deleting a node at the beginning of the list takes constant time `O ( 1 )`. Select correct statement(s) about Doubly Linked List: Deleting a node at the end of the list takes constant time O ( 1 ). The node which is deleted from the list will be claimed by the garbage collector  
  
. Select incorrect statement about skip list: The number of reference fields indicates the level of each node, and the number of levels is maxLevel = `[lgn]`+ 1 Select incorrect statement about skip list: In 20-element skip list, the node in position 3 points to the node in position 7 The search time is O (lgn) in the worst case. Select correct statement(s): A singly linked list is a node that has a link only to its successor in this seq uence Inserting a new node at the end of the singly linked list without tail field req uires O( n ) steps. Linked lists allow easy insertion and deletion of information because such opera tions have a local impact on the list. True Which of the following operations take O( 1)time: Searching one node in singly linked list without tail in the best case. Deleting one node from the begin of doubly linked list Select correct statements about Linked List: Skip lists was motivated by the need to speed up the searching process. The efficiency of search in singly and doubly linked lists can be improved by dy namically organizing the list in a certain manner using Self-Ogranizing Lists. Which of the following statements about the Stack are true Popping operation in the linked list implementation is executed in the constant time O(1) Popping operation in the array implementation is executed in the constant time O (1) In the circular array version of the Queue class, which operations require O(n) linear time for their worst-case behavior enqueue() when the capacity has been reached clear() Suppose temp refers to a node in a linked list (using the SLLNode class with ins tance variables called info and next). What boolean expression will be true when temp refers to the tail node of the list? (temp.next == null) Suppose that the variable temp refers to a node in a linked list (using the SLLN ode class with instance variables called info and next). What statement changes temp so that it refers to the next node? temp = temp . next ; Which boolean expression indicates whether the data in two nodes (p and q) are t he same. Assume that neither p nor q is null. p.info == q.info or p.info.equals(q.info) Which of these operations are likely to have a constant time for worst-case in t he linked lists? None of the others. Select false statement: In the array list, poping is executed in O (lgn) to the worst case.  
  
Select true statements about stack: The Java implementation of the stack is potentially fatal. Stack can be implemented by linked list. Which of the following methods of queue are true: enqueue(el) Put the element el at the end of the queue. firstEl() Return the first element in the queue without removing it. isEmpty() Check to see if the queue is empty. Which of the following can be executed in constant time O ( n ) when deleting a node of a singly linked list in the average case. when deleting a node of a singly linked list in the worst case. Which of the following about stack are true: The most top element is the latest added element. Operations of stack are based on Last in First out structure. In the doubly linked list implementation of queue, enqueuing can be executed in constant time O( n). False In the array implementation of queue, enqueuing can be executed in constant time O(1) True Which of the following statement about the Recursion is true All of the others When a method call is executed, which information is not saved in the activation record? Instances of classes. Current depth of recursion The operation for adding an entry to a stack is traditionally called: push In the array version of the Queue, which operations require Otime for their wors t-case behavior? None of the others Which of the following applications may use a stack? All of the others. In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? None of the others Which of the following statements are true: The return address is address of the caller s instruction immediately following th e call. The recursive version increases program readability, improves self-documentation and simplifies coding. When converting a method from a recursive version into an iterative version, The brevity of program formulation lost. However, the brevity may not be an issu e in Java. Program clarity can be diminished. Select incorrect statement about Recursion:  
  
The anchor or ground case allows for the construction of new objects out of basi c elements or objects that have already been constructed Which of the following statements are false: An activation record contains code of method owning it An activation record still exists after a method owning it ends Which of the following statement about the Binary Tree is true Binary Trees can be implemented as arrays The search process of Binary Search Tree takes O( n ) time in the worst case. Which of the following statement about the Tree Traversal is false Tree traversal is the process of visiting each node in the tree some times. Postorder tree traversal can be only implemented in recursion. When a method call is executed, which information is not saved in the activation record? Current depth of recursion. With respect to the execution of recursive function (method), ....... None of the others. With respect to recursion, select correct statement. All of the others. With respect to recursion, select correct statement. (1) Recursive version execu tes slower than iterative version. (2) Iterative version executes slower than re cursive version. (3) Recursive version needs more memory than iterative version (4) Iterative version needs more memory than recursive version Statements ..... and ...... are true. None of the other Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. True In all cases, nonrecursive implementation is faster recursive implementation. False Which of the following concepts of tree are true: The level of a node must be between 1 and height of the tree. The height of a nonempty tree is the maximum level of a node in the tree. The level of a node is the length of the path from the root to the node plus 1. Select correct statement: Breath-First traversal is implemented using queue. The complexity of searching depends on the shape of the tree and the position of the node in the tree. For a binary tree with n nodes, there are n! different traversals. Select incorrect statement: Morris s algorithm does not temporarily change tree structure. A recursive implementation of preorder tree traversal uses stack explicitly. Depth-first traversal can not be implemented if not using stack. Which of the following statements are true: Using Polish notation, all expressions have to be broken down unambiguous into s eparate operations and put into their proper order. Expression trees do not use parentheses. Polish notation eliminates all parentheses from formulas.  
  
In which order does an postorder traversal visit the nodes of the above tree: j k e f l m g b c n h q r s o p i d a Which of the following statement about the Graph is true All of the others What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Breadth-first search. Select the one TRUE statement. Every perfect balanced binary tree is also a balanced binary tree. ......... will visit nodes of a tree starting from the highest (or lowest) level and moving down (or up) level by level and at a level, it visits nodes from lef t to right (or from right to left). Breath-First Traversal Study the following statements: (1) A drawback of a balanced tree is the searchtime may be out of control. (2) The DSW algorithm can be used to rebalance a bin ary tree. (3) An AVL tree is one in which the height of the left and the right s ubtrees of the every node must be same. The statement (1) is ....., the statemen t (2) is ...... and the statement (3) is ...... False, true, false A heap implemetation is an excellent demonstration for a ....... priority queue Which of the following sentences are true: The complexity of DFS is `O(|V| + |E|)` , where `|V|` is number of vertices and `|E|` is number of edges. The complexity of DFS is `O(|V|^2)` Which of the following statements about finding the shortest path are true: The complexity of Dijkstra s algorithm is `O(|V|^2)` For label-correcting method, information of any label can be changed during appl ication of method. Which of the following statement about spanning tree is false: None of the others. Which of the following statements about graph coloring is true: Sequential Coloring algorithm establishes the sequence of vertices and a sequenc e of color before coloring them. The complexity of sequential Coloring algorithm is `O(|V|^2)` Which graph representation is best? It depends on the problem Most of the label-setting and label-correcting methods are used to find from one vertex to all other vertices. True When is insertionsort a good choice for sorting an array? The array s size is not large . Which algorithms have the complexity of O(n lgn) Quick sort in the best case. Heap sort in the worst case.  
  
What is the worst-case time for mergesort to sort an array of n elements? O ( ` n `lg` n`) Selectionsort and quicksort both fall into the same category of sorting algorith ms. What is this category? Worst time is quadratic. Interchange sorts Using adjacency matrix representation for a graph of n vertices and m edges, wha t is the expected number of operations needed to loop through the graph to find down adjacent list of a known vertex? O( n ) What graph traversal algorithm uses a queue to keep track of vertices which need s to be processed? Breadth-first search. Suppose that you have a directed graph representing all the flights that an airl ine flies. What algorithm might be used to find the best sequence of connections from one city to another? A shortest-path algorithm. The ..... algorithm can be used to schedule the final exams so that no student h as two exams at the same time. Graph coloring Which of the following statements about efficient sorting is false : Only insertion sort is apllied in all h-sorts of shell sort. Shell sort divides the original array into physical subarrays, sorting them sepa rately, then merging and dividing them again to sort the new subarrays until the whole array is sorted. Which of the following statements about efficient sorting is false: The worst case is when the bound divides an array into subarrays of approximatel y length `n/2` The best case of quick sort happens when bound is the largest (the smallest) ele ment of the array. Which of the following statements is true: None of others. Which of the following statements about efficient sorting is true: In heap sort, the number of calling moveDown() in the first loop is n/2 Heap sort starts from the end of the array by finding the largest elements. What is the worst-case time for mergesort to sort an array of n elements? O(nlgn) What is the worst-case time for bubble sort to sort an array of n elements? O`(n^2)` What is the worst-case time for heapsort to sort an array of n elements? O(nlgn) With respect to number times of moving data in the selection sort algorithm appl ied to an array of a elements, how many times are the array elements moved in th e worst case? O( n )  
  
In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. False Which of the following statement about Open Addressing are false: In linear probing of the open addressing method, the position in which key can b e stored is found by sequentially searching starting from the begin of table. Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup. Which of the following statement are true: Linked list can be used in Bucket Addressing. Coalesced hashing combines linear probing with chaning. Which of the following statement about Perfect Hash Functions are true: Cichelli s method uses an exhaustive search. Cichelli s method is used to hash relatively small number of reserved words. Select correct statements : A reorganization of the file is avoided by using extendible hashing if the direc tory overflows. The characteristic feature of extendible hashing is the organization of the inde x, which is expandable table. Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. True Which of the following statement is true: If hash function transforms different keys into different numbers, it is called a perfect hash function. Select correct statements: The boundary folding method can not be applied to string data. In shift folding method, the key is usually divided into even parts of some fixe d size plus some remainder and added. What is the worst-case time for binary search finding a single item in an array? Logarithmic time What is the best definition of a collision situation in a hash table? Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? None of the others Suppose that you place m items in a hash table with an array size of s. What is the correct formula for the load factor? m/s Which of the following data structure can be implement Huffman Coding Singly linked list. Priority queue. Doubly linked list. Select incorrect statements about Huffman Coding: Huffman tree is only implemented by non-recursive algorithm. Adaptive Huffman coding uses breath-first left-to-right tree traversal generates  
  
a list of nodes with nonincreasing frequency counter. Select correct statement about Run-length encoding. A serious drawback of run-length encoding is that it relies entirely on the occu rrences of runs. Select correct statement about Ziv-Lempel Code. All of the others. In data compression, no special punctuation is required to separate two codeword s in a coded message True. Which of the following data structure can be implemented using Huffman Coding? All of the others Select incorrect statement about restrictions need to be imposed on the prospect ive codes: Each codeword may be corresponds to one or many symbols. Select correct statement about Run-length encoding. A serious drawback of run-length encoding is that it relies entirely on the occu rrences of runs. Identify whether below code has error or not: Compile error. Identify whether below code has error or not: 3 compile errors. Which of the following statements are true a. object1.process2 ( N ) calls process2 of class ExtC. object2.process3 ( N ) call process3 of class C. Identify which alogrithm the above code implements Insertion Sort Identify which alogrithm the above code implements Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n FEDCBA What is output if nontail is called with i = 3 Runtime error is issued. What is output if nontail is called with i = 5 1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i  
  
teration i=5 of the outer for loop completed {2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loop completed {19,18,14,6,5,10,15} Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: There may be runtime error in some case Identify whether the code of pop method has error or not: There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n \nFEDCBA Suppose that obj is an Object variable and s is a String variable. Which of the following statements is a correctly-compiling widening conversion? Don't worry a bout possible run-time exceptions All of the others Suppose that obj is an Object variable and that it refers to an Integer object. If s is a String variable, then which statement is correct about the assignment "s = (String) obj;"? The statement will not compile. Suppose that obj is an Object variable, and consider these two possible assignme nts: obj = new Integer(42);obj = new Double(42.0);Both assignments compile corre ctly. Select the true statement about what happens at run time: Both assignments will run with no errors, regardless of which one occurs first. Identify which alogrithm the above code implements Heap Sort Identify which alogrithm the above code implements Quick sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is 123456\n 654321 Here is an INCORRECT pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced: Which of these unbalanced seque nces does the above code think is balanced? ((()())) ((())) Here is an INCORRECT pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced:declare a character stackwhile ( more input is available){read a characterif ( the character is a '(' )push it on the stackelse if ( the character is a ')' and the stack is not empty )pop a cha racter off the stackelseprint "unbalanced" and exit}print "balanced"Consider the usual algorithm for determining whether a sequence of parentheses is balanced. What is the maximum number of parentheses that will appear on the stack AT ANY O NE TIME when the algorithm analyzes: (()(())(()))? 3 What is output if inorderRVL is executed and structure of Binary Tree is the fol  
  
lowing image: 30 40 11 10 7 14 3 2 1 Consider this binary search tree:Suppose we remove the root, replacing it with s omething from the left subtree. What will be the new root ? 5 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4} {9,4,2,5,8,10,3}. What is output after iteration i=4 of the outer for loop completed 1 3 5 8 9 7 0 2 6 4 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4}. What is output af ter iteration i=4 of the outer for loop completed {9 8 5 3 1 7 0 2 6 4} Consider the following method:public static void test\_a(int n){System.out.printl n(n + " ");if (n>0)test\_a(n-2);}What is printed by the call test\_a(4)? 4 2 0 Consider the following method:public static void test\_a(int n){if (n>0)test\_a(n2);System.out.println(n + " ");}What is printed by the call test\_a(4)?Identify w hether the code of pop method has error or not 0 2 4 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4}. What is output af ter iteration j=4 of the inner for loop completed 3 5 8 1 9 7 0 2 6 4 144 Nothing is wrong with the code, it will be compiled without errors. The program will compile without error and print 2 when running. 120 Study the following pseudocode:What is written to the screen if the input is "AB BAABBA" ? ABBAABBA number >= 0 && number < 10 O`(n^2)` 1, 2, 3, 4, 5, 7, 6 O`(n^2)` Assume that the class BSTNode is implemented for a node in a binary search tree and basic operations on a stack are implemented also and the operation visit wil l process requirements on a node of the tree. Consider the following tree traver sal algorithm in Java:Which traversal does the above algorithm implement? Preorder tree traversal b. In the second phase, this algorithm exchanges n-1 times the root with the ele ment in position i.c. moveDown() is called n/2 times to create the heap in the f irst phase.d. The heap is restored n-1 times in the second phase. All of the others. 7  
  
40 30 7 10 11 3 1 2 14 Consider the following algorithm: 5 5 //////////////////////// 2 file check of Vuong////////////////////////////////// /// Which statements are true about inheritance? Answer: In Java the extends clause is used to specify inheritance Which statements are true about interfaces? Answer: Interfaces can extend any number of other interfaces Which one of these for statements is valid Answer: for (int i=0, j=100; i  
   
When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? Answer: None of the others Select the one TRUE statement Answer: Every perfect balanced binary tree is also a balanced binary tree . Is visiting node starting from the highest (or lowest) level and moving down (or up) level by level, visiting nodes on each level from left to right (or from ri ght to left) Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. Answer: The DSW Algorithm A heap is an exellent way to implement a Answer: priority queue ..  
  
What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exam s at the same time by applying Answer: Graph coloring What is the worst-case time for mergesort to sort an array of n elements? Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? Answer: O(n2) What is the worst-case time for heapsort to sort an array of n elements? Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? Answer: O(n) What is the worst-case time for binary search finding a single item in an array? Answer: Logarithmic time What is the best definition of a collision in a hash table? Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent  
  
ries that can be placed in the table? Answer: There is no maximum Suppose you place m items in a hash table with an array size of s. What is the c orrect formula for the load factor? Answer: m/s Which of the following data structure can be implement Huffman Coding Answer: All of the others Select incorrect statements about restrictions need to be imposed on the prospec tive codes: Answer: Each codeword may corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer: All of the others. Which statement is true about the following code?a. Interface1 and Interface 2 do not match, therefore, MyClass cannot implement them both.b. The decl arations of void g() in the two interfaces conflict, therefore, the code will no t compilec. The declarations of int VAL\_B in the two interfaces conflict, th erefore, the code will not compile.d. Nothing is wrong with the code, it will compile without errors. Answer: Nothing is wrong with the code, it will compile without errors. What will be the result of attempting to compile and run the following program?a . The program will fail to compile.b. The program will compile without error and print 0 when run.c. The program will compile without error and print 1 when run.d. The program will compile without error and print 2 when run. Answer: The program will compile without error and print 2 when run. Which digits, and in which order, will be printed when the following program is run?a. The program will only print 1 and 4, in that order.b. The program will only print 1, 4, and 5, in that order.c. The program will only print 3 an d 5, in that order.d. The program will only print 1, 2, 4, and 5, in that orde r. Answer: The program will only print 1, 4, and 5, in that order. Consider the following pseudocode: What is written to the screen for the input " ABBAABBA"?a. ABABABABb. BABABABAc. ABBAABBAd. BAABBAAB Answer: ABBAABBA Consider the following method: What values of number are directly handled by the stopping case?a. number < 0b. number < 10c. number >= 0 && number < 10d. number > 10 Answer: number >= 0 && number < 10 Consider the following sort algorithm Number of comparisons of keys and comparis ons of i and least is:a. n(n-1)/2b. n-1c. ((n-1)(n+2))/2d. None of the others Answer: ((n-1)(n+2))/2 Consider the following sort algorithm: Assume that this algorithm is executed wi th array {7,1,2,3,4,5,6}. What is output after iteration i=4 of the outer for lo  
  
op completeda. 1, 2, 3, 4, 5, 6, 7b. , 6d. 1, 2, 3, 4, 7, 5, 6 Answer: 1, 2, 3, 4, 5, 7, 6  
  
1, 2, 3, 7, 4, 5, 6c.  
  
1, 2, 3, 4, 5, 7  
  
Consider the following sort algorithm: Number of comparisons of keys isa. (n(n+1))/2b. (n(n-1))/2c. n2d. n2/2 Answer: (n(n-1))/2 Consider the following algorithm: Which traversal does the above algorithm imple ment?a. Breadth-first traversalb. Inorder tree traversalc. Postorde r tree traversald. Preorder tree traversal Answer: Preorder tree traversal Consider the following sort algorithm:a. moveDown() is called times to c reate the heap in the first phase.b. The heap is restored times in the seco nd phase.c. In the second phase, this algorithm exchanges times the root wi th the element in position.d. All of the others. Answer: All of the others. Consider this method declaration:How many asterisks are printed by the method ca ll quiz(5)?a. 8b. 4c. 7d. None of the others Answer: 7 Consider the following traversal algorithm:What is output if this algorithm is e xecuted on the following binary tree:a. 40 30 7 10 11 3 1 2 14b. 1 3 2 7 10 40 30 11 14c. 1 2 3 14 7 10 11 40 30d. 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 Consider the following algorithm:a. Answer: 5 3b. 9c. 5d. 8  
  
Which statement, when inserted at the indicated position in the following code, will cause a runtime exception?a. x = y;b. z = x;c. y = (B) x;d. z = (C) y;e. y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? Answer: zer@ Which statement concerning the switch construct is true? Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: (new Integer(str)).intValue() Select correct statements about a singly linked list. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly.  
  
Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Properties of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong statements: Answer: Recursion can be only replaced by iteration. In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum Consider algorithm of the 8-queen problem: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: All of the others. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements:a. Djikstra's shortest path algorithm can be applie d to undirected graph.b. The breadth-first search can be used to find the shortest path from a source vertex to the destination vertexc. All of the other s.d. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method?  
  
Answer: All of the others. Which of the following statements about shortest path finding algorithms are tru e: Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6. Which statement i s correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: Answer: All of the others. The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution: Answer: Open addressing. Which of the following hashing methods can cause collision: Answer: All of the others. Select incorrect statements:a. Quadratic probing eliminates primary clustering but suffers from the less severe secondary clustering.b. In double hashin g the step size depends on the key and is obtained from a secondary hash functio n.c. In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on.d. None of the othe rs Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10, X: 010, Y: 101, W: 1 00, Z: 110. Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. Answer: True Select incorrect statements about Data compression: Answer: Huffman tree can be only constructed bottom-up. Which expressions will evaluate to true if preceded by the following code?a.  
  
(a == "Hello")b. Answer: (a == c)  
  
(a == b)c. a.equals(b)  
  
(a == c)d.  
  
a.equals(b)  
  
Consider the following alogorithm: What is output when calling TriangularNumber( 4)a. 6b. 10c. 15d. 20 Answer: 10 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime stack when calling TriangularNumber(10) Answer: 11 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime stack when traversing the below tree using the above algorithm? Answer: 5 Consider the following alogorithm: What is maximum number of elements in queue w hen traversing the below tree using the above algorithm? Answer: 4 Consider the following alogorithm: Assume array data[] = {2,8,6,1,10,15,3,12,11} . Array data after ending the first loop. Answer: {15,12,6,11,10,2,3,1,8} Consider the following alogorithm: Select right statements:a. In the first loo p, moveDown is called n/2 times in any case.b. The total number of moves in all executions of moveDown in the second phase is O(lgn).c. All of the other s.d. None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. What will be printed when the following program is run?a. 2d. An error occurs when compiling the program. Answer: 2 0b. 1c.  
  
What will be printed when the following program is run?a. this is g of A b. t his is g of C c. An error occurs when compiling the programd. Nothing is print ed Answer: this is g of C Consider the following alogorithm: Assume array data[] = {4,10,8,3,12,17,5,14,13 }. Array data after executing 4 iterations of outer loop. Answer: {3,4,8,10,12,17,5,14,13} Consider the following alogorithm: How many times is number 840 printed out when call pattern(840) Answer: 2 Consider the following alogorithm: How many integers will the program print when calling nonTail(n), n > 0 Answer: 2^n-1 Consider the following alogorithm:The above algorithm is used to:a. Count nu mber of even values in binary tree.b. Print even numbers in binary tree.c. Print even numbers in ascending order.d. Print and count number of even v alues in binary tree. Answer: Print even numbers in binary tree.  
  
Consider the following alogorithmThe above algorithm is used to:a. mber of nodes in binary tree.b. Calculate height of binary tree.c. mber of nonterminal nodes in binary tree.d. None of the others. Answer: Calculate height of binary tree.  
  
Count nu Count nu  
  
Consider the following alogorithm:The above algorithm is used to:a. Check wh ether binary tree is balanced.b. Check whether height of left subtree is greater than height of right subtreec. Check whether height of right subtree is greater than height of left subtree.d. None of the others Answer: Check whether binary tree is balanced. Select incorrect statements about Object Oriented Programming Answer:Static methods and variables are associated with the class itself and are called instance methods and instance variables Which of the following keywords are access modifier Answer:Protected b. Private Select correct statementsa. A derived class can override the definition of a final method by introducing its own definitionb. In an abstract class, me thods are only declared but not definedc. Subclasses or derived classes in herit the fields and methods from their base classd. An abstract data type ca n be part of a program in the form of an interface Answer: In an abstract class, methods are only declared but not defined ///// Su bclasses or derived classes inherit the fields and methods from their base class ////// An abstract data type can be part of a program in the form of an interfa ce Which of following statements are true Answer: An object can be saved in a file if its class type is stated to implemen t the Serializable interface /// If the vector s capacity is greater than its size , then a new element can be inserted at the end of the vector immediately Which of sentences about singly linked list are true Answer: Deleting a node at the beginning of the list takes, constant time O(1)// /c. On the overage, delete operation executes O(n) steps////e. There is no immediate access to the predecessor of any node in list Select correct statement(s) about Doubly Linked List Answer: The node which is deleted from the list will be claimed by the garbage c ollector //// Deleting a node at the end of the list takes constant time O(1) Select incorrect statement about skip lista. In a skip list of n nodes, for e ach k and I such that 1 <= k <= [lgn] b. The number of reference fields indicates the level of each node and the number of levels is maxLevel = [lgn] +1c. All of the othersd. None of the others Answer:None of the others Select incorrect statement about skip list: Answer:The search time is O(lgn) in the worst case Select false statement: a. Stack can be implemented using linked list/// b. Stack is applied to Java Virtual Machine/// c. In the array list, popping is ex ecuted in O(lgn) to the worst case///d. In the array list, popping is executed i n constant time O(1) Answer:In the array list, popping is executed in O(lgn) to the worst case Select true statements about stack  
  
Answer:The Java implementation of the stack is potentially fatal ///// Stack ca n be implemented by linked list Which of the following methods of queue are true Answer: isEmpty() Check to see if the queue is empty d. the element el at the end of the queue f. firstEl() nt in the queue without removing it enqueue(el) Put Return the first eleme  
  
Which of the following can be executed in constant time O(n) Answer: When deleting a node of a singly linked list in the average case b. When deleting a node of a singly linked list in the worst case Which of the following statements are true Answer: The return address is address of the caller s instruction immediately foll owing the call b. The recursive version increases program readability, imp roves self-documentation and simplifies coding When converting a method from a recursive version into a iterative version Answer: The brevity of program formulation lost. However, the brevity may not be an issue in Java b. Program clarity can be diminished Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system Answer:True In all cases, nonrecursive implementation is faster recursive implementation Answer:True Which of the following concepts of tree are true a. The height of a nonempty tree is the maximum level of a node in the tree . c. The level of a node is the length of the path from the root to the node plus 1 d. The level of a node must be between 1 and height of the tree Select correct statement Answer: The complexity of searching depends on the shape of the tree and the pos ition of the node in the tree d. Breath-First traversal is implemented us ing queue e. For a binary tree with n nodes, there are n! different traversal s Select incorrect statement Answer: Depth-first traversal can not be implemented if not using stack c. A recursive implementation of preorder tree traversal uses stack explicitly e. Morris s algorithm does not temporarily change tree structure Which of the following statements are true Answer: Polish notation eliminate all parentheses from formulas b. Using Po lish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order e. Expression trees do not use pare ntheses Which of the following sentences are true: a. All algorithms are more efficien t if the underlying graph traversal is not BFS but DFS b. The complexity o f DFS is O(|V|2) c. The complexity of DFS is O(|V| + |E|), where |V| is numb er of vertices and |E| is number of edges d. To prevent loop from happen is a l algorithm for traversing a graph, each visited vertex can be marked Answer: The complexity of DFS is O(|V| + |E|), where |V| is number of vertices a nd |E| is number of edges d. To prevent loop from happen is al algorithm for traversing a graph, each visited vertex can be marked  
  
Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithm is O(|V||E|) for any graph b. For labe l-correcting method, information of any label can be changed during application of method c. Ford s algorithm relies on label-setting method d. The comp lexity of Dijkstra s algorithm using heap is O(}V}ln|V|) e. The complexity o f Dijkstra s algorithm is O(|V|2) Answer: For label-correcting method, information of any label can be changed dur ing application of method c. Ford s algorithm relies on label-setting method e. The complexity of Dijkstra s algorithm is O(|V|2) Which of the following statement about spanning tree is false a. The comp lexity of Kruskal s algorithm depends on the complexity of the sorting method appl ied b. The complexity of Kruskal s algorithm depends on the method used f or cycle detection c. All of the others d. None of the others Answer:None of the others Which of the following statements about graph coloring is true Answer: In sequential coloring algorithm, vertices must be ordered according to indices already to the vertices b. The complexity of sequential corloring a lgorithm is O(|V|2) c. Sequential Coloring algorithm establishes the sequence o f vertices and a sequence of color before colring them Which of the following statements about efficient sorting is false Answer: Shell sort divides the original array into physical subarrays, sorting t hem separately, then merging and dividing them again to sort the new subarrays u ntil the whole array is sorted d. Only insertion sort is apllied in all hsorts of shell sort Which of the following statements about efficient sorting is false Answer: The worst case is when the bound divides an array into subarrays of appr oximately length n/2 c. The best case of quick sort happens when bound i s the largest (the smallest) element of the array Which of the following statement is true: a. All the forting methods implemen ted in java is applied to any basic data type b. For objects comparison, a comparison criterion must be implemented by user for all classes c. All of o thers d. None of others Answer:For objects comparison, a comparison criterion must be implemented by use r for all classes In insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case Answer:False Which of the following statement about Open Addressing are false Answer: Using quadratic probing gives much better results than linear probing an d avoids the problem of cluster buildup b. In linear probing of the open ad dressing method, the position in which key can be stored is found by sequentiall y searching starting from the begin of table Which of the following statement are true: a. Linked list can be used in Bucke t Addressing b. In chaining, searches always fast if using linked lists c. Self-organizing linked list can be used to improve performance in chaini ng d. Coalesced hashing combines linear probing with chaning Answer:Linked list can be used in Bucket Addressing b. Self-organizing linked list can be used to improve performance in chaining c. Coalesced hashin g combines linear probing with chaning Which of the following statement about Perfect Hash Functions are true  
  
Answer: Cichelli s method uses an exhaustive search b. Chichelli s method is used to hash relatively small number of reserved words Select correct statements: a. Extendible hashing is directory less technique b. Extendible hashing is faster than and requires less space than Linear ha shing c. A reorganization of the file is avoided by using extendible hash ing if the directory overflows d. The characteristic feature of extendible hashing is the organization of the index, which is expandable table e. Linear hashing is director technique Answer:A reorganization of the file is avoided by using extendible hashing if th e directory overflows d. The characteristic feature of extendible hashing is the organization of the index, which is expandable table Which of the following data structure can be implement Huffman Coding a. Singly linked list b. Queue c. Skip list d. Priority queue e. Doubly linked list Answer:Singly linked list b. Priority queue c. Doubly linked list Select incorrect statement about Huffman Coding: a. Huffman tree is only imp lemented by non-recursive algorithm b. Huffman tree can be built top-down c. David Huffman s algorithm may not be useful for sending some specialized files d. Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter. Answer:Huffman tree is only implemented by non-recursive algorithm b. Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter. Select correct statement about Run-length encoding Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs Identify whether below code has error or not Answer:Compile error Identify whether below code has error or nota. 3 compile errorsb. c. Runtime errord. 2 compile errors Answer:3 compile errors No error  
  
Which of the following statements are true: a. object1.process2( N ) calls process2 of class ExtC b. object2.process1(1) does not issue compiler error c. object2.process3 ( N ) call process 3 of class C d. object3.process2( N ) call p rocess2 of class C Answer:object1.process2( N ) calls process2 of class ExtC /// object2.process3 ( N ) call process 3 of class C Identify which algorithm the above code implements: a. Insertion sort b. Bubble Sort c. Selection Sort d. Radix Sort Answer:Insertion sort Identify which algorithm the above code implements: a. Quick sort b. Radix so rt c. Bubble sort d. Heap sort Answer:Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n Answer:FEDCBA What is output if nontail is called with i=3: a. b. 1213121 c. 12321 d. 21312 Answer:Runtime error is issued Runtime error is issued  
  
What is output if nontail is called with i = 5: a. . 3135313 d. None of the others Answer:1315131  
  
1315131 b.  
  
13531 c  
  
What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image Answer:2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree if follo wing image Answer:2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loop completed Answer:{19,18,14,6,5,10,15} ///////////data of Duy ///////////////////////// In the doubly linked list implementation, dequeuing can be executed in constant time O(1) answer: true In the doubly linked list implementation, enqueuing can be executed in constant time O(n) answer: false In the doubly linked list implementation, denqueuing can be executed in constant time O(n) answer: false In the array implementation, dequeuing can be executed in time O(n) answer: false In the doubly linked list implementation,enqueuing can be executed in time O(n) answer: false Which of the following methods of queue are true: answer:enqueue(el) Put the element el at the end of the queue + dequeue() Take t he first element from the queue + isEmpty() Check to see if the queue is empty + firstEl() Return the first element in the queue without removing it + clear() C lear the queue Select true statements about stack: answer: Stack can be implemented by linked list // The Java implementation of th e stack is potentially fatal Which of the following about queue are true: answer: A queue is an FIFO structure Which of the following statement of queue are true: answer: Using array for queue implementation may bot be the best choice // A nat ural queue implementation is a linked list (doubly linked list) Select false statement: answer: In the array list, poping is executed in time O(n) to the worst case  
  
Which of the following about stack are true: answer: The most top element is the latest added element // Operation of stack b ased on Last in First out structure When converting a method from a recursive version into an itrative version, answer:The brevity of program formulation lost.However, the brevity may not be i n issue in Java // The program clarity can be diminished What is the value of h(20) answer:11 What is the value of h(1) answer: 14 Select incorect statement: answer:The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed In all cases, nonrecursive implementation is faster recursive implementation. answer: false Which of the following statements are false: answer: An activation record still exists after a method owning it ends. // An a ctivation record contains code of method owning it. Which of the following statements are true: answer: The data area containing state information of one method is called an ac tivation record or stack frame // The sate of each method ,including main(), is characterized by the contents of all automatic variables ,the values of the meth od's parameters and the return address. What is the value of A(3,1) answer: 13 What are number of additions and number of calls to find Fib(8) using recursive definition; answer: 33 and 67 Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. answer:true Which of the following statements are true: answer: The recursive version increases program readability ,improves self-docum entation and simplifies coding // The return address is address of the caller's instruction immediately following the call Which of the following answer: The level of a plus 1 // The level of e height of a nonempty concepts of tree are true: node is the length of the path from the root to the node a node must be between 1 and the height of the tree // Th is the maximum level of a node in the tree. are true: all parentheses from formulas // Using Polish be broken down unambiguously into separate ope order // Expression trees do not use parentthe  
  
Which of the following statements anwer: Polish notation eliminates notation, all expressions have to rations and put into their proper s Select incorrect statement:  
  
answer: Morris's algorithm does not temporarily change tree structure // A Recur sive implementation of preorder tree traversal uses stack explicitly // Depth-fi rst traversal can not be implemented if not using stack Which of the following statements about heap are false: answer: Heap represented by array can be traversed eaily in depth-first // A hea p can be defined as an array heap of length n in which Consider below recursive define about tree:1.An empty structures is an empty tre e.2. If t1,..,tk are disjointed trees ,then the structure whose root has its chi ldren the root t1,..,tk is also a treeanswer: true answer: true In all binary trees, there are 2^i nodes at level i. answer: false Which of the following methods are used to traverse a tree without using any sta ck or threads: answer: Traversal through Tree Transformation Which operation is used in DSW Algorithm: answer: Rotation Select correct statement: answer: The complexity of searching depends on the shape of the treee and the po sition of the node in the tree // For a binary tree with n nodes, there are n! d ifferent traversals// Breath-First traversal is implemented using queue Which of the following methods are used for Depth-First Traversal answer:All of others Which of the following statement about finding the shortest path is false: answer: The complexity of WFI's algorithms is |V^3| that is good efficiency for any graph // WFI's algorithm doesn't allows detecting cycles in graph Which of the following statements about graph coloring is true: answer: The chromatic number of the cycle graph K100 is 100 // In Brelaz's algo rithm, the loop "For each uncolored vertex u adjacent to v" takes O(|V|) Most of the label-setting and label-correcting methods are used to find the shor test paths from one vertex to all other vertices: answer:True Which graph representation is best? answer: It depends on the problem. Which of the following statements about finding the shortest path are true: answer: The methods solving the shortest path problems are divided into classes: label-setting and label-correcting // For label-setting methods ,in each pass t hrough the vertices still to be processed, one vertex is set to value that remai ns unchanged to the end of the execution. Which of the following statements about graph coloring is true: answer: Sequential Coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them // The complexity of sequential Coloring algorith is O(|V^2|) Which of the following are false: answer: A graph from v1 to vn is a sequence of edges (v1v2), edges (v2v3)...edge s (vn-1vn) and no edge is repeated // A circuit is a cycle in which all vertices  
  
must be different Which of the following statements about finding the shortest path are true: answer: The complexity of Dijkstra's algorithm is O(|V|^2) // The complexity of Ford's algorithm is O(|V||E|) for any graph (?) // The complexity of Dijkstra's algorithm using the heap is O((|E| + |V|)lg|V|) // For label-correcting method, information of any label can be changed during application of method Which of the following statement about spanning tree is false: answer: None of the others Which of the following statement about spanning tree is true: answer: All of the others (The complexity of Kruskal's algorithm depends on the complexity of the sorting method applied // The complexity of Kruskal's algorith m depends on the method used for cycle detection. Which of the following statements about elementary sorting is true: answer: None of the others Which of the following statements about efficient sorting is true: answer:Mergersort can be made more efficient by replacing recursion with iterati on // insertion sort is applied to small portions of an array to improve perform ance In Insertion Sort, the number of movements and comparisons for a randomly orded array is closer to the beast case. answer:False Which of the following statements about efficient sorting is true: answer: All of the others (Heap sort starts from the end of array by finding the largest elements // In heap sort, for the best case the number of calling moveD own() in the first loop is n/2) Select correct statements about Radix sort: answer: bitRadixsort() can be improved by implementing array insted of using que ue // One of techniques radix sort uses is by looking at each number as a string of bits so that all integers are euqal length In insertion sort algorithm, the number of times variable tmp is loaded and unlo aded in the outer for loop is not: answer: None of the other Which of the following statements about Quich sort is true: answer: Quick sort is recursive in nature // A strategy for selecting a bound is to choose the element located in the middle of the array Which of the following statements about efficient sorting is true: answer: Shell sort is more efficient than insertion sort even if in case there a re only two increments // There is no sequence of increments it optimal In sertion sort, which case is only one comparison made for each position i: answer: The data are already in order Which of the following statements about elementary sorting is true: answer:Advantage of using insertion sort is that it sorts the array only when is really necessary Select correct statements: answer: The characteristic feature of extendible hashing is the organization of the index ,which is an expendable table // A reorganization of the file is avoid  
  
ed by using extendible hashing if the directory overflows. Which of the following statement about Perfect Hash Functions are true: answer: In a minimal perfect hash function, wasting time for collision resolutio n and wasting space for unused table cells are avoided // The function in FHCD a lgorithm is found in three steps: mapping ,ordering and searching Which of the following statement about Perfect Hash Functions are true: answer: Cihcelli's method uses an exhaustive search // Cichelli's method is used to hash relatively small number of reserved Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. answer: True Which of the following statement is true: answer: If hash function transforms different keys into different numbers, it is called a perfect hash function Which of the following statement about Open Addressing are false: answer: In linear probing of the open addressing method, the position in which k ey can be stored is found by sequentially searching starting from the begin of t able // Using qadratic probling gives much better results than linear probing an d avoids the problem of cluster buildup Which of the following statement are true: answer: Coalesced hashing combine linear probing with chaining // Linked list ca n be used in Bucket Addressing Which of the following statement are false: answer: In chaining ,searches always fast if using linked list // Self-organizin g linked lists do not improve performance in chaining. Which of the following statement are false: answer: The best value of divisor can be any // The folding method ( instead of division method) is the preferred choice for the hash function if very little is know about the keys. Which of the following statement are true: answer: If there are 32 items and a 64-cel table then there are 8^64 hash functi ons // The divsion method depends on division modulo // Good value for m are pri me numbers that are not very close powers of 2 Select correct statements: answer: In shifting folding method (+ boundary folding) the key is usually divid ed into even parts of some fixed size plus some remainder and added // The bound ary folding method is applied to number data. Select correct statements: answer: In practice ,the mid-square method is more efficient to the size of tabl e that is power of 2// The middle part of bit representation of the square of a key is extracted using a mask and a shift operation The length of the codeword for a given sysbol mj should not less than the length of the codeword of a less probable symbol mi; that is,if P(mi)<=P(mj), then L(m i)<=L(mj) for 1<=i, j<=n answer: false Select correct statement about Ziv-Lempei Code.  
  
answer: All of the others (The codeword of Ziv-Lempei Code is a triple // Ziv-Le mpei Code uses buffer of symbols) Entropy of source M is defined by: answer: False Select correct statement about Run-length encoding. answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs Select incorrect statements about Huffman Coding: answer: Huffman tree is only implemented by non-recursive algorithm // Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list o f nodes with nonincreasing frequency counter Select correct statements about Huffman Coding: answer: David Huffman's algorithm is not useful for sending some specialized fil es // Huffman tree can be built top-down Each codeword corresponds to one or more symbols. answer: False Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique. answer: flase Which of the following statements about Merge sort method are incorrect? answer: Merge sort can be made more effcient by replacing recursion with iterati on Select correct statements answer: The characteritic feature of.../ A reoganization of the file is avoided. . Suppose that obj is an variable and that is refers to an Integer object.If s is a String variable,then which statement is correct about the assignment "s = (Str ing) obj;"? answer: The statement will compile and run with no exception Which of the following Sorting algorithms use Divide and conquer strategy? answer: Quick sort Algorithms are applied to graphs: answer: All of others Which traversal method is used in Adaptive Huffman tree? answer: Breadth Firsttraversal Suppose temp refers to the third node on the doubly linked list that has more th an 5 nodes.What statement changes temp so that it refers to the first no? answer: temp = temp.previous.next,previous Select incorrect statement about skip list: The search time is O(lgn) in the worst case Which of the following statements is true: answer: All of others " What is number of comparisions in the worst case of mergesort to sort an array of n elements ?" answer: O (n^2) A chained hash table has an array size of 1024.What is the maximum number of ent ries that can be placed in the table? answer: there is no maximum When a method call is executed, which information does its activation record con tain? answer: Current depth ofrecursion Which of the following definitions about in a hash table are incorrect? answer: Two entries with different data have the exact same key.  
  
Which of the statements about Ziv-Lempel Code are false? answer: Ziv-Lempel uses buffer of symbols When a method call is executed, which infomation is not saved in the activation record? answer: Location where the method should return when done. When converting a method from a recursive version into an iterative version, answer: The program always run slower. Select correct statement about Ziv-Lempel Code. answer: None of others Which of the following statements about the Stack are true? answer: Clear operation in the linked list implemetation is executed.../Pushing operation... Which of the following Sorting algorithms have complexity of O(n) in best case? answer: All of others What is the value of the Shift Folding Hash Function if K = 43-65-76-7 and Tsize = 100 answer: 91 The partition function below is used for partitioning the array a in quicksort: answer: 2,3,5,6,8,10,7,9 Basically, the complexity of inserting a node after a given node in a singly lin ked lists is ... answer: O(1) Consider the following pseudocode: answer:HowAreYou Select the statement that is the most correct.Which of the following application s may use a stack? answer: Store all variables in a program The following is the main part of selection sort pseudocode: answer:2,3,11,12,5,10,7,4,8,6 Specify the correct statement about hashing algorithm (Select the best answer). answer:If the coalesced method is used .... What is the value of the Boundary Folding Hash Function K = 43-65-76-7 and Tsize = 100? answer: 82 Select the statement that is the most correct. answer: For a recursive method to terminate there must be one or more limit cond itions. Select the most correct statement about the complexity of insertion sort. answer: The best case is O(n),and the worst case is O(n^2) Consider the AVL tree below.What is the breadth first traversal of the tree afte r inserting a node with value 28? answer: 35,20,45,10,28,40,25,30 Which of the following algorithms in graphs can be implemented by extending Dept h First Search algorithm? answer: All of others Suppose temps refers tosome node in a doubly linked list.What boolean expression can be used to check whether temp refer to the first node of the list? answer: temp.previous.next.previous==null Which of the following problems may use the recursion technique? answer: Perform symbolic differentiation Which of the following can be executed in constent time O(n) answer: when deleting a node of..../when deleting a node of.... Which of the following statements about Run-Length EnCoding are False answer: Run-Length encoding can be applied to compress faximages Which of the following strategies fit to Binary Search trees that only have some elements constantly accessed? answer: Use the DSW algorithm Which of the following statements are true: answer: Using Polish notation, all expressions have to broken down/Preorder,inor der and..  
  
A queue is implemented using a doubly linked list, which of the following operat ions require O(n) time? answer: None of others What is the number of comparisions and swaps in the best case for creating a hea p using top down method (William's method)? answer: the number of comparision is lgn and swaps is zero A recursive method may be eliminated by using ............. answer: All of others Which of these operations are likely to have a constant time for worst-case in t he singly linked lists? answer: get(int index) :Retums the element at the specified position in this lis t. What is the complexity of inserting a node in a perfectly balanced tree for wors t case? answer: none of others Which of the following problem use stack implicitly or explicitly? answer: Eight-queen problem What is the worst-case time for finding an element in a Binary tree? answer: O(n^2) In the array implementation of the queue, which operations require constant time ? answer: enqueue Which of the following statement about Perfect Hash Function are true? answer: Cichelli's method uses an .../ Cichelli's method is used to.... Select correct statement: answer: A reoganization of the file is..../The characteritic.... Whcich of the following data structure can be Implemen Huffman Coding answer: Singly linked list/Priority queue/Doubly linked list Select incorrect statement about Huffman coding: answer: Huffman tree is only..../David Huffman's algorithm.../Adaptive Huffman.. . Select correct statement about Run-length encoding. answer: A serious drawback of run-length encoding is that it relies etirely on t he ... Oriented Programming: Select incorrect statements about Object Answer: tatic methods and variables are associated with the class itself and are called instance methods and instance variables//The combination of data and rel ated operations is called information hiding principle. Which of the following keywords are access modifier: Answer:private / protected Select correct statements: Answer: Subclasses or derived classes inherit the fields and methods from their base class.//An abstract data type can be part of a program in the form of an in terface. Which of following statements are true: Answer: An object can be saved in a file if its class type is stated to implemen t the Serializable interface.//If the vector s capacity is greater than its size, then a new element can be inserted at the end of the vector immediately. Select true statement(s) about Java. Answer: Variable names are strings of any length of letters, digits, underscores , and dollar signs//For a postfix operator, autoincrement (or autodecrement) is the last operation performed// Characters are 16 bits long x = 7; y = 4 \* ++x; z = 5 \* x--; what are the values of x, y, z after executing  
  
the above three statements? Answer: x = 7, y = 32, z = 40 What kind of methods of a class can be called by methods which is belong to anot her class? Answer: public methods Can two different classes contain methods with the same name? Answer:Yes, this is always allowed. What is the primary purpose of a constructor? Answer:To initialize each object as it is declared. Select correct statement. Answer:In Java, the extends clause is used to specify inheritance Select correct statement. Answer:Interfaces can extend any number of other interfaces. Select correct Java statement. Answer:for (int i=0, j=100; i < j; i++, --j) {;} Select incorrect statement. In java, ...... Answer:The default modifier means that a method or a field is accessible to deri ved classes. Which of sentences about singly linked list are true: Answer:There is no immediate access to the predecessor of any node in list.//On the average, delete operation executes O ( n ) steps.//Deleting a node at the be ginning of the list takes constant time `O ( 1 )`. Select correct statement(s) about Doubly Linked List: Answer: Deleting a node at the end of the list takes constant time O ( 1 ).//The node which is deleted from the list will be claimed by the garbage collector. Select incorrect statement about skip list: Answer: The number of reference fields indicates the level of each node, and the number of levels is maxLevel = `[lgn]`+ 1 Select incorrect statement about skip list: Answer: In 20-element skip list, the node in position 3 points to the node in po sition 7//The search time is O (lgn) in the worst case. Select correct statement(s): Answer: A singly linked list is a node that has a link only to its successor in this sequence//Inserting a new node at the end of the singly linked list without tail field requires O( n ) steps. Linked lists allow easy insertion and deletion of information because such opera tions have a local impact on the list. Answer:True Which of the following operations take O( 1)time: Answer: Searching one node in singly linked list without tail in the best case. //Deleting one node from the begin of doubly linked list Select correct statements about Linked List: Answer: Skip lists was motivated by the need to speed up the searching process./ / The efficiency of search in singly and doubly linked lists can be improved by dynamically organizing the list in a certain manner using Self-Ogranizing Lists.  
  
Which of the following statements about the Stack are true Answer: Popping operation in the linked list implementation is executed in the c onstant time O(1)//Popping operation in the array implementation is executed in the constant time O(1) In the circular array version of the Queue class, which operations require O(n) linear time for their worst-case behavior Answer:enqueue() when the capacity has been reached//clear() Suppose temp refers to a node in a linked list (using the SLLNode class with ins tance variables called info and next). What boolean expression will be true when temp refers to the tail node of the list? Answer:(temp.next == null) Suppose that the variable temp refers to a node in a linked list (using the SLLN ode class with instance variables called info and next). What statement changes temp so that it refers to the next node? Answer:temp = temp . next ; Which boolean expression indicates whether the data in two nodes (p and q) are t he same. Assume that neither p nor q is null. Answer:p.info == q.info or p.info.equals(q.info) Which of these operations are likely to have a constant time for worst-case in t he linked lists? Answer:None of the others. Select false statement: Answer:In the array list, poping is executed in O (lgn) to the worst case. Select true statements about stack: Answer:The Java implementation of the stack is potentially fatal.//Stack can be implemented by linked list. Which of the following methods of queue are true: Answer: enqueue(el) Put the element el at the end of the queue.//firstEl() Retur n the first element in the queue without removing it.//isEmpty() Check to see if the queue is empty. Which of the following can be executed in constant time O ( n ) Answer: when deleting a node of a singly linked list in the average case.//when deleting a node of a singly linked list in the worst case. Which of the following about stack are true: Answer: The most top element is the latest added element.//Operations of stack a re based on Last in First out structure. In the doubly linked list implementation of queue, enqueuing can be executed in constant time O( n). Answer: False In the array implementation of queue, enqueuing can be executed in constant time O(1) Answer:True Which of the following statement about the Recursion is true Answer:All of the others When a method call is executed, which information is not saved in the activation  
  
record? Answer: Instances of classes.//Current depth of recursion The operation for adding an entry to a stack is traditionally called: Answer:push In the array version of the Queue, which operations require Otime for their wors t-case behavior? Answer:None of the others Which of the following applications may use a stack? Answer:All of the others. In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? Answer:None of the others Which of the following statements are true: Answer:The return address is address of the caller s instruction immediately follo wing the call.//The recursive version increases program readability, improves se lf-documentation and simplifies coding. When converting a method from a recursive version into an iterative version, Answer: The brevity of program formulation lost. However, the brevity may not be an issue in Java.//Program clarity can be diminished. Select incorrect statement about Recursion: Answer:The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed Which of the following statements are false: Answer:An activation record contains code of method owning it//An activation rec ord still exists after a method owning it ends Which of the following statement about the Binary Tree is true Answer:Binary Trees can be implemented as arrays//The search process of Binary S earch Tree takes O( n ) time in the worst case. Which of the following statement about the Tree Traversal is false Answer:Tree traversal is the process of visiting each node in the tree some time s.//Postorder tree traversal can be only implemented in recursion. When a method call is executed, which information is not saved in the activation record? Answer:Current depth of recursion. With respect to the execution of recursive function (method), ....... Answer:None of the others. With respect to recursion, select correct statement. Answer:All of the others. With respect to recursion, select correct statement. (1) Recursive version execu tes slower than iterative version. (2) Iterative version executes slower than re cursive version. (3) Recursive version needs more memory than iterative version (4) Iterative version needs more memory than recursive version Statements ..... and ...... are true. Answer:None of the other Recursive definitions on most computers are eventually implemented using a run-t  
  
ime stack and this implementation is done by the operating system. Answer:True In all cases, nonrecursive implementation is faster recursive implementation. Answer:False Which of the following concepts of tree are true: Answer:The level of a node must be between 1 and height of the tree.//The height of a nonempty tree is the maximum level of a node in the tree.//The level of a node is the length of the path from the root to the node plus 1. Select correct statement: Answer:Breath-First traversal is implemented using queue.//The complexity of sea rching depends on the shape of the tree and the position of the node in the tree .//For a binary tree with n nodes, there are n! different traversals. Select incorrect statement: Answer:Morris s algorithm does not temporarily change tree structure.//A recursive implementation of preorder tree traversal uses stack explicitly.//Depth-first t raversal can not be implemented if not using stack. Which of the following statements are true: Answer:Using Polish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order.//Expression trees do not use parentheses.//Polish notation eliminates all parentheses from formulas. In which order does an postorder traversal visit the nodes of the above tree: Answer:j k e f l m g b c n h q r s o p i d a Which of the following statement about the Graph is true Answer:All of the others What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer:Breadth-first search. Select the one TRUE statement. Answer:Every perfect balanced binary tree is also a balanced binary tree. ......... will visit nodes of a tree starting from the highest (or lowest) level and moving down (or up) level by level and at a level, it visits nodes from lef t to right (or from right to left). Answer:Breath-First Traversal Study the following statements: (1) A drawback of a balanced tree is the searchtime may be out of control. (2) The DSW algorithm can be used to rebalance a bin ary tree. (3) An AVL tree is one in which the height of the left and the right s ubtrees of the every node must be same. The statement (1) is ....., the statemen t (2) is ...... and the statement (3) is ...... Answer:False, true, false A heap implemetation is an excellent demonstration for a ....... Answer:priority queue Which of the following sentences are true: Answer:The complexity of DFS is `O(|V| + |E|)` , where `|V|` is number of vertic es and `|E|` is number of edges.//The complexity of DFS is `O(|V|^2)` Which of the following statements about finding the shortest path are true: Answer:The complexity of Dijkstra s algorithm is `O(|V|^2)`//For label-correcting  
  
method, information of any label can be changed during application of method. Which of the following statement about spanning tree is false: Answer:None of the others. Which of the following statements about graph coloring is true: Answer:Sequential Coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them.//The complexity of sequential Coloring a lgorithm is `O(|V|^2)` Which graph representation is best? Answer:It depends on the problem Most of the label-setting and label-correcting methods are used to find from one vertex to all other vertices. Answer:True When is insertionsort a good choice for sorting an array? Answer:The array s size is not large . Which algorithms have the complexity of O(n lgn) Answer:Quick sort in the best case.//Heap sort in the worst case. What is the worst-case time for mergesort to sort an array of n elements? Answer:O ( ` n `lg` n`) Selectionsort and quicksort both fall into the same category of sorting algorith ms. What is this category? Answer:Worst time is quadratic.//Interchange sorts Using adjacency matrix representation for a graph of n vertices and m edges, wha t is the expected number of operations needed to loop through the graph to find down adjacent list of a known vertex? Answer:O( n ) What graph traversal algorithm uses a queue to keep track of vertices which need s to be processed? Answer:Breadth-first search. Suppose that you have a directed graph representing all the flights that an airl ine flies. What algorithm might be used to find the best sequence of connections from one city to another? Answer:A shortest-path algorithm. The ..... algorithm can be used to schedule the final exams so that no student h as two exams at the same time. Answer:Graph coloring Which of the following statements about efficient sorting is false : Answer:Only insertion sort is apllied in all h-sorts of shell sort.//Shell sort divides the original array into physical subarrays, sorting them separately, the n merging and dividing them again to sort the new subarrays until the whole arra y is sorted. Which of the following statements about efficient sorting is false: Answer:The worst case is when the bound divides an array into subarrays of appro ximately length `n/2`//The best case of quick sort happens when bound is the lar gest (the smallest) element of the array. Which of the following statements is true:  
  
Answer:None of others. Which of the following statements about efficient sorting is true: Answer:In heap sort, the number of calling moveDown() in the first loop is n/2// Heap sort starts from the end of the array by finding the largest elements. What is the worst-case time for mergesort to sort an array of n elements? Answer:O(nlgn) What is the worst-case time for bubble sort to sort an array of n elements? Answer:O`(n^2)` What is the worst-case time for heapsort to sort an array of n elements? Answer:O(nlgn) With respect to number times of moving data in the selection sort algorithm appl ied to an array of a elements, how many times are the array elements moved in th e worst case? Answer:O( n ) In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. Answer:False Which of the following statement about Open Addressing are false: Answer:In linear probing of the open addressing method, the position in which ke y can be stored is found by sequentially searching starting from the begin of ta ble.//Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup. Which of the following statement are true: Answer:Linked list can be used in Bucket Addressing.//Coalesced hashing combines linear probing with chaning. Which of the following statement about Perfect Hash Functions are true: Answer:Cichelli s method uses an exhaustive search.//Cichelli s method is used to ha sh relatively small number of reserved words. Select correct statements : Answer:A reorganization of the file is avoided by using extendible hashing if th e directory overflows.//The characteristic feature of extendible hashing is the organization of the index, which is expandable table. Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. Answer:True Which of the following statement is true: Answer:If hash function transforms different keys into different numbers, it is called a perfect hash function. Select correct statements: Answer:The boundary folding method can not be applied to string data.//In shift folding method, the key is usually divided into even parts of some fixed size pl us some remainder and added. What is the worst-case time for binary search finding a single item in an array? Answer:Logarithmic time  
  
What is the best definition of a collision situation in a hash table? Answer:Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? Answer:None of the others Suppose that you place m items in a hash table with an array size of s. What is the correct formula for the load factor? Answer:m/s Which of the following data structure can be implement Huffman Coding Answer:Singly linked list.//Priority queue.//Doubly linked list. Select incorrect statements about Huffman Coding: Answer:Huffman tree is only implemented by non-recursive algorithm.//Adaptive Hu ffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter. Select correct statement about Run-length encoding. Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer:All of the others. In data compression, no special punctuation is required to separate two codeword s in a coded message Answer:True. Which of the following data structure can be implemented using Huffman Coding? Answer:All of the others Select incorrect statement about restrictions need to be imposed on the prospect ive codes: Answer:Each codeword may be corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs. Identify whether below code has error or not: Answer:Compile error. Identify whether below code has error or not: Answer:3 compile errors. Which of the following statements are true Answer:a. object1.process2 ( N ) calls process2 of class ExtC.//object2.process3 ( N ) c all process3 of class C. Identify which alogrithm the above code implements Answer:Insertion Sort Identify which alogrithm the above code implements Answer:Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n  
  
Answer:FEDCBA What is output if nontail is called with i = 3 Answer:Runtime error is issued. What is output if nontail is called with i = 5 Answer:1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: Answer:2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: Answer:2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loop completed Answer:{19,18,14,6,5,10,15} Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: Answer:There may be runtime error in some case Identify whether the code of pop method has error or not: Answer:There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n Answer: \nFEDCBA Suppose that obj is an Object variable and s is a String variable. Which of the following statements is a correctly-compiling widening conversion? Don't worry a bout possible run-time exceptions Answer:All of the others Suppose that obj is an Object variable and that it refers to an Integer object. If s is a String variable, then which statement is correct about the assignment "s = (String) obj;"? Answer:The statement will not compile. Suppose that obj is an Object variable, and consider these two possible assignme nts: obj = new Integer(42);obj = new Double(42.0);Both assignments compile corre ctly. Select the true statement about what happens at run time: Answer:Both assignments will run with no errors, regardless of which one occurs first. Identify which alogrithm the above code implements Answer:Heap Sort Identify which alogrithm the above code implements Answer:Quick sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is 123456\n Answer:654321  
  
Here is an INCORRECT pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced: Which of these unbalanced seque nces does the above code think is balanced? Answer:((()()))//((())) Here is an INCORRECT pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced:declare a character stackwhile ( more input is available){read a characterif ( the character is a '(' )push it on the stackelse if ( the character is a ')' and the stack is not empty )pop a cha racter off the stackelseprint "unbalanced" and exit}print "balanced"Consider the usual algorithm for determining whether a sequence of parentheses is balanced. What is the maximum number of parentheses that will appear on the stack AT ANY O NE TIME when the algorithm analyzes: (()(())(()))? Answer:3 What is output if inorderRVL is executed and structure of Binary Tree is the fol lowing image: Answer:30 40 11 10 7 14 3 2 1 Consider this binary search tree:Suppose we remove the root, replacing it with s omething from the left subtree. What will be the new root ? Answer:5 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4} {9,4,2,5,8,10,3}. What is output after iteration i=4 of the outer for loop completed Answer:1 3 5 8 9 7 0 2 6 4 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4}. What is output af ter iteration i=4 of the outer for loop completed Answer:{9 8 5 3 1 7 0 2 6 4} Consider the following method:public static void test\_a(int n){System.out.printl n(n + " ");if (n>0)test\_a(n-2);}What is printed by the call test\_a(4)? Answer:4 2 0 Consider the following method:public static void test\_a(int n){if (n>0)test\_a(n2);System.out.println(n + " ");}What is printed by the call test\_a(4)?Identify w hether the code of pop method has error or not Answer:0 2 4 Assume that sort is executed with array {5 3 8 9 1 7 0 2 6 4}. What is output af ter iteration j=4 of the inner for loop completed Answer:3 5 8 1 9 7 0 2 6 4 Answer:144 Answer:Nothing is wrong with the code, it will be compiled without errors. The program will compile without error and print 2 when running. Answer:120 Study the following pseudocode:What is written to the screen if the input is "AB BAABBA" ? Answer:ABBAABBA number >= 0 && number < 10 Answer:O`(n^2)`  
  
Answer:1, 2, 3, 4, 5, 7, 6 Answer:O`(n^2)` Assume that the class BSTNode is implemented for a node in a binary search tree and basic operations on a stack are implemented also and the operation visit wil l process requirements on a node of the tree. Consider the following tree traver sal algorithm in Java:Which traversal does the above algorithm implement? Answer:Preorder tree traversal b. In the second phase, this algorithm exchanges n-1 times the root with the ele ment in position i.c. moveDown() is called n/2 times to create the heap in the f irst phase.d. The heap is restored n-1 times in the second phase. Answer:All of the others. Answer:7 Answer:40 30 7 10 11 3 1 2 14 Consider the following algorithm: Answer:5 Answer:5 //////////////////////// 2 file check of Vuong////////////////////////////////// /// Which statements are true about inheritance? Answer: In Java the extends clause is used to specify inheritance Which statements are true about interfaces? Answer: Interfaces can extend any number of other interfaces Which one of these for statements is valid Answer: for (int i=0, j=100; i  
   
Answer: push In the array version of the Queue, which operations require O(n) time for their worst-case behavior? Answer: None of the others Which of the following applications many use a stack? Answer: All of the others In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? Answer: None of the others When a method call is executed, which information is not saved in the activation record? Answer: Current depth of recursion When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? Answer: None of the others Select the one TRUE statement Answer: Every perfect balanced binary tree is also a balanced binary tree . Is visiting node starting from the highest (or lowest) level and moving down (or up) level by level, visiting nodes on each level from left to right (or from ri ght to left) Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. Answer: The DSW Algorithm A heap is an exellent way to implement a Answer: priority queue ..  
  
What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exam s at the same time by applying Answer: Graph coloring What is the worst-case time for mergesort to sort an array of n elements? Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements?  
  
Answer: O(n2) What is the worst-case time for heapsort to sort an array of n elements? Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? Answer: O(n) What is the worst-case time for binary search finding a single item in an array? Answer: Logarithmic time What is the best definition of a collision in a hash table? Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? Answer: There is no maximum Suppose you place m items in a hash table with an array size of s. What is the c orrect formula for the load factor? Answer: m/s Which of the following data structure can be implement Huffman Coding Answer: All of the others Select incorrect statements about restrictions need to be imposed on the prospec tive codes: Answer: Each codeword may corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer: All of the others. Which statement is true about the following code?a. Interface1 and Interface 2 do not match, therefore, MyClass cannot implement them both.b. The decl arations of void g() in the two interfaces conflict, therefore, the code will no t compilec. The declarations of int VAL\_B in the two interfaces conflict, th erefore, the code will not compile.d. Nothing is wrong with the code, it will compile without errors. Answer: Nothing is wrong with the code, it will compile without errors. What will be the result of attempting to compile and run a. The program will fail to compile. b. The program will compile without error and print c. The program will compile without error and print ram will compile without error and print 2 when run. Answer: The program will compile without error and print Which digits, and in which order, will be run? a. The program will only print 1 and .b. The program will only print 1, 4, c. The program will only print 3 and d. The program will only print 1, 2, Answer: The program will only print 1, 4, the following program? 0 when run. 1 when run.d. The prog 2 when run.  
  
printed when the following program is 4, in that order and 5, in that order. 5, in that order. 4, and 5, in that order. and 5, in that order.  
  
Consider the following pseudocode: What is written to the screen for the input " ABBAABBA"? a. ABABABABb. BABABABAc. ABBAABBAd. BAABBAAB Answer: ABBAABBA Consider the following method: What values of number are directly handled by the stopping case? a. number < 0b. number < 10c. number >= 0 && number < 10d. number > 10 Answer: number >= 0 && number < 10 Consider the following sort algorithm Number of comparisons of keys and comparis ons of i and least is: a. n(n-1)/2b. n-1c. ((n-1)(n+2))/2d. None of the others Answer: ((n-1)(n+2))/2 Consider the following sort algorithm: Assume that this algorithm is executed wi th array {7,1,2,3,4,5,6}. What is output after iteration i=4 of the outer for lo op completeda. 1, 2, 3, 4, 5, 6, 7b. 1, 2, 3, 7, 4, 5, 6c. 1, 2, 3, 4, 5, 7 , 6d. 1, 2, 3, 4, 7, 5, 6 Answer: 1, 2, 3, 4, 5, 7, 6 Consider the following sort algorithm: Number of comparisons of keys isa. (n(n+1))/2b. (n(n-1))/2c. n2d. n2/2 Answer: (n(n-1))/2 Consider the following algorithm: Which traversal does the above algorithm imple ment? a. Breadth-first traversal b. Inorder tree traversal c. Postorder tree traversal d. Preorder tree traversal Answer: Preorder tree traversal Consider the following sort algorithm: a. moveDown() is called times to create the heap in the first phase .b. The heap is restored times in the second phase. c. In the second phase, this algorithm exchanges times the root with the e lement in position. d. All of the others. Answer: All of the others. Consider this method declaration:How many asterisks are printed by the method ca ll quiz(5)? a. 8b. 4c. 7d. None of the others Answer: 7 Consider the following traversal algorithm:What is output if this algorithm is e xecuted on the following binary tree: a. 40 30 7 10 11 3 1 2 14 b. 1 3 2 7 10 40 30 11 14  
  
c. 1 2 3 14 7 10 11 40 30 d. 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 Consider the following algorithm: a. 3 b. 9 c. 5 d. 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception?a. x = y;b. z = x;c. y = (B) x;d. z = (C) y;e. y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? Answer: zer@ Which statement concerning the switch construct is true? Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: (new Integer(str)).intValue() Select correct statements about a singly linked list. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Properties of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong statements:  
  
Answer: Recursion can be only replaced by iteration. In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum Consider algorithm of the 8-queen problem: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: All of the others. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements: a. Djikstra's shortest path algorithm can be applied to undirected graph. b. The breadth-first search can be used to find the shortest path from a so urce vertex to the destination vertex c. All of the others. d. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? Answer: All of the others. Which of the following statements about shortest path finding algorithms are tru e: Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6. Which statement i s correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: Answer: All of the others.  
  
The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution: Answer: Open addressing. Which of the following hashing methods can cause collision: Answer: All of the others. Select incorrect statements: a. Quadratic probing eliminates primary clustering but suffers from the les s severe secondary clustering. b. In double hashing the step size depends on the key and is obtained from a secondary hash function. c. In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on.d. None of the othe rs Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10, X: 010, Y: 101, W: 1 00, Z: 110. Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. Answer: True Select incorrect statements about Data compression: Answer: Huffman tree can be only constructed bottom-up. Which expressions will evaluate to true if preceded by the following code?a. (a == "Hello")b. (a == b)c. (a == c)d. a.equals(b) Answer: (a == c) a.equals(b) Consider the following alogorithm: What is output when calling TriangularNumber( 4) a. 6 b. 10 c. 15 d. 20 Answer: 10 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime stack when calling TriangularNumber(10) Answer: 11 Consider the following alogorithm:  
  
What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? Answer: 5 Consider the following alogorithm: What is maximum number of elements in queue w hen traversing the below tree using the above algorithm? Answer: 4 Consider the following alogorithm: Assume array data[] = {2,8,6,1,10,15,3,12,11} . Array data after ending the first loop. Answer: {15,12,6,11,10,2,3,1,8} Consider the following alogorithm: Select right statements: a. In the first loop, moveDown is called n/2 times in any case. b. The total number of moves in all executions of moveDown in the second ph ase is O(lgn) .c. All of the others. d. None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. What will be printed when the following program is run? a. 0 b. 1 c. 2 d.An error occurs when compiling the program. Answer: 2  
  
What will be printed when the following program is run? a. this is g of A b. this is g of C c. An error occurs when compiling the pr amd. Nothing is printed Answer: this is g of C Consider the following alogorithm: Assume array data[] = {4,10,8,3,12,17,5,14,13 }. Array data after executing 4 iterations of outer loop. Answer: {3,4,8,10,12,17,5,14,13} Consider the following alogorithm: How many times is number 840 printed out when call pattern(840) Answer: 2 Consider the following alogorithm: How many integers will the program print when calling nonTail(n), n > 0 Answer: 2^n-1 Consider the following alogorithm:The above algorithm is used to: a. Count number of even values in binary tree. b. Print even numbers in binary tree.c. Print even numbers in ascending order. d. Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Consider the following alogorithmThe above algorithm is used to: a. Count number of nodes in binary tree. b. Calculate height of binary tree. c. Count number of nonterminal nodes in binary tree.d. None of the othe rs.  
  
Answer: Calculate height of binary tree. Consider the following alogorithm:The above algorithm is used to: a. Check whether binary tree is balanced. b. Check whether height of left subtree is greater than height of right sub tree c. Check whether height of right subtree is greater than height of left sub tree. d. None of the others Answer: Check whether binary tree is balanced. Select incorrect statements about Object Oriented Programming Answer:Static methods and variables are associated with the class itself and are called instance methods and instance variables Which of the following keywords are access modifier Answer:Protected b. Private Select correct statements a. A derived class can override the definition of a final method by introdu cing its own definition b. In an abstract class, methods are only declared but not defined c. Subclasses or derived classes inherit the fields and methods from their base class d. An abstract data type can be part of a program in the form of an interfa ce Answer: In an abstract class, methods are only declared but not defined ///// Su bclasses or derived classes inherit the fields and methods from their base class ////// An abstract data type can be part of a program in the form of an interfa ce Which of following statements are true Answer: An object can be saved in a file if its class type is stated to implemen t the Serializable interface /// If the vector s capacity is greater than its size , then a new element can be inserted at the end of the vector immediately Which of sentences about singly linked list are true Answer: Deleting a node at the beginning of the list takes, constant time O(1)// / c. On the overage, delete operation executes O(n) steps//// e. There is no immediate access to the predecessor of any node in list Select correct statement(s) about Doubly Linked List Answer: The node which is deleted from the list will be claimed by the garbage c ollector //// Deleting a node at the end of the list takes constant time O(1) Select incorrect statement about skip lista. In a skip list of n nodes, for e ach k and I such that 1 <= k <= [lgn] b. The number of reference fields indicates the level of each node and the number of levels is maxLevel = [lgn] +1c. All of the othersd. None of the others Answer:None of the others Select incorrect statement about skip list: Answer:The search time is O(lgn) in the worst case Select a. b. c. false statement: Stack can be implemented using linked list/// Stack is applied to Java Virtual Machine/// In the array list, popping is executed in O(lgn) to the worst case///  
  
d. In the array list, popping is executed in constant time O(1) Answer:In the array list, popping is executed in O(lgn) to the worst case Select true statements about stack Answer:The Java implementation of the stack is potentially fatal ///// Stack ca n be implemented by linked list Which of the following methods of queue are true Answer: isEmpty() Check to see if the queue is empty d. the element el at the end of the queue f. firstEl() nt in the queue without removing it enqueue(el) Put Return the first eleme  
  
Which of the following can be executed in constant time O(n) Answer: When deleting a node of a singly linked list in the average case b. When deleting a node of a singly linked list in the worst case Which of the following statements are true Answer: The return address is address of the caller s instruction immediately foll owing the call b. The recursive version increases program readability, imp roves self-documentation and simplifies coding When converting a method from a recursive version into a iterative version Answer: The brevity of program formulation lost. However, the brevity may not be an issue in Java b. Program clarity can be diminished Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system Answer:True In all cases, nonrecursive implementation is faster recursive implementation Answer:True Which of the following concepts of tree are true a. The height of a nonempty tree is the maximum level of a node in the tree . c. The level of a node is the length of the path from the root to the node plus 1 d. The level of a node must be between 1 and height of the tree Select correct statement Answer: The complexity of searching depends on the shape of the tree and the pos ition of the node in the tree d. Breath-First traversal is implemented us ing queue e. For a binary tree with n nodes, there are n! different traversal s Select incorrect statement Answer: Depth-first traversal can not be implemented if not using stack c. A recursive implementation of preorder tree traversal uses stack explicitly e. Morris s algorithm does not temporarily change tree structure Which of the following statements are true Answer: Polish notation eliminate all parentheses from formulas b. Using Po lish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order e. Expression trees do not use pare ntheses Which of the following sentences are true: a. All algorithms are more efficien t if the underlying graph traversal is not BFS but DFS b. The complexity o f DFS is O(|V|2) c. The complexity of DFS is O(|V| + |E|), where |V| is numb  
  
er of vertices and |E| is number of edges d. To prevent loop from happen is a l algorithm for traversing a graph, each visited vertex can be marked Answer: The complexity of DFS is O(|V| + |E|), where |V| is number of vertices a nd |E| is number of edges d. To prevent loop from happen is al algorithm for traversing a graph, each visited vertex can be marked Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithm is O(|V||E|) for any graph b. For labe l-correcting method, information of any label can be changed during application of method c. Ford s algorithm relies on label-setting method d. The comp lexity of Dijkstra s algorithm using heap is O(}V}ln|V|) e. The complexity o f Dijkstra s algorithm is O(|V|2) Answer: For label-correcting method, information of any label can be changed dur ing application of method c. Ford s algorithm relies on label-setting method e. The complexity of Dijkstra s algorithm is O(|V|2) Which of the following statement about spanning tree is false a. The comp lexity of Kruskal s algorithm depends on the complexity of the sorting method appl ied b. The complexity of Kruskal s algorithm depends on the method used f or cycle detection c. All of the others d. None of the others Answer:None of the others Which of the following statements about graph coloring is true Answer: In sequential coloring algorithm, vertices must be ordered according to indices already to the vertices b. The complexity of sequential corloring a lgorithm is O(|V|2) c. Sequential Coloring algorithm establishes the sequence o f vertices and a sequence of color before colring them Which of the following statements about efficient sorting is false Answer: Shell sort divides the original array into physical subarrays, sorting t hem separately, then merging and dividing them again to sort the new subarrays u ntil the whole array is sorted d. Only insertion sort is apllied in all hsorts of shell sort Which of the following statements about efficient sorting is false Answer: The worst case is when the bound divides an array into subarrays of appr oximately length n/2 c. The best case of quick sort happens when bound i s the largest (the smallest) element of the array Which of the following statement is true: a. All the forting methods implemen ted in java is applied to any basic data type b. For objects comparison, a comparison criterion must be implemented by user for all classes c. All of o thers d. None of others Answer:For objects comparison, a comparison criterion must be implemented by use r for all classes In insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case Answer:False Which of the following statement about Open Addressing are false Answer: Using quadratic probing gives much better results than linear probing an d avoids the problem of cluster buildup b. In linear probing of the open ad dressing method, the position in which key can be stored is found by sequentiall y searching starting from the begin of table Which of the following statement are true: a. Linked list can be used in Bucke t Addressing b. In chaining, searches always fast if using linked lists c. Self-organizing linked list can be used to improve performance in chaini ng d. Coalesced hashing combines linear probing with chaning  
  
Answer:Linked list can be used in Bucket Addressing b. Self-organizing linked list can be used to improve performance in chaining c. Coalesced hashin g combines linear probing with chaning Which of the following statement about Perfect Hash Functions are true Answer: Cichelli s method uses an exhaustive search b. Chichelli s method is used to hash relatively small number of reserved words Select correct statements: a. Extendible hashing is directory less technique b. Extendible hashing is faster than and requires less space than Linear ha shing c. A reorganization of the file is avoided by using extendible hash ing if the directory overflows d. The characteristic feature of extendible hashing is the organization of the index, which is expandable table e. Linear hashing is director technique Answer:A reorganization of the file is avoided by using extendible hashing if th e directory overflows d. The characteristic feature of extendible hashing is the organization of the index, which is expandable table Which of the following data structure can be implement Huffman Coding a. Singly linked list b. Queue c. Skip list d. Priority queue e. Doubly linked list Answer:Singly linked list b. Priority queue c. Doubly linked list Select incorrect statement about Huffman Coding: a. Huffman tree is only imp lemented by non-recursive algorithm b. Huffman tree can be built top-down c. David Huffman s algorithm may not be useful for sending some specialized files d. Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter. Answer:Huffman tree is only implemented by non-recursive algorithm b. Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter. Select correct statement about Run-length encoding Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs Identify whether below code has error or not Answer:Compile error Identify whether below code has error or nota. 3 compile errorsb. c. Runtime errord. 2 compile errors Answer:3 compile errors No error  
  
Which of the following statements are true: a. object1.process2( N ) calls process2 of class ExtC b. object2.process1(1) does not issue compiler error c. object2.process3 ( N ) call process 3 of class C d. object3.process2( N ) call p rocess2 of class C Answer:object1.process2( N ) calls process2 of class ExtC /// object2.process3 ( N ) call process 3 of class C Identify which algorithm the above code implements: a. Insertion sort b. Bubble Sort c. Selection Sort d. Radix Sort Answer:Insertion sort Identify which algorithm the above code implements: a. Quick sort b. Radix so rt c. Bubble sort d. Heap sort Answer:Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n  
  
Answer:FEDCBA What is output if nontail is called with i=3: a. b. 1213121 c. 12321 d. 21312 Answer:Runtime error is issued What is output if nontail is called with i = 5: a. . 3135313 d. None of the others Answer:1315131 Runtime error is issued  
  
1315131 b.  
  
13531 c  
  
What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image Answer:2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree if follo wing image Answer:2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loop completed Answer:{19,18,14,6,5,10,15} //////////////////Duy Cu nho//////////// quizzzzzzzzzzz////////////// In the doubly linked list implementation, dequeuing can be executed in constant time O(1) answer: true In the doubly linked list implementation, enqueuing can be executed in constant time O(n) answer: false In the doubly linked list implementation, denqueuing can be executed in constant time O(n) answer: false In the array implementation, dequeuing can be executed in time O(n) answer: false In the doubly linked list implementation,enqueuing can be executed in time O(n) answer: false Which of the following methods of queue are true: answer:enqueue(el) Put the element el at the end of the queue + dequeue() Take t he first element from the queue + isEmpty() Check to see if the queue is empty + firstEl() Return the first element in the queue without removing it + clear() C lear the queue Select true statements about stack: answer: Stack can be implemented by linked list // The Java implementation of th e stack is potentially fatal Which of the following about queue are true: answer: A queue is an FIFO structure Which of the following statement of queue are true: answer: Using array for queue implementation may bot be the best choice // A nat  
  
ural queue implementation is a linked list (doubly linked list) Select false statement: answer: In the array list, poping is executed in time O(n) to the worst case Which of the following about stack are true: answer: The most top element is the latest added element // Operation of stack b ased on Last in First out structure When converting a method from a recursive version into an itrative version, answer:The brevity of program formulation lost.However, the brevity may not be i n issue in Java // The program clarity can be diminished What is the value of h(20) answer:11 What is the value of h(1) answer: 14 Select incorect statement: answer:The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed In all cases, nonrecursive implementation is faster recursive implementation. answer: false Which of the following statements are false: answer: An activation record still exists after a method owning it ends. // An a ctivation record contains code of method owning it. Which of the following statements are true: answer: The data area containing state information of one method is called an ac tivation record or stack frame // The sate of each method ,including main(), is characterized by the contents of all automatic variables ,the values of the meth od's parameters and the return address. What is the value of A(3,1) answer: 13 What are number of additions and number of calls to find Fib(8) using recursive definition; answer: 33 and 67 Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. answer:true Which of the following statements are true: answer: The recursive version increases program readability ,improves self-docum entation and simplifies coding // The return address is address of the caller's instruction immediately following the call Which of the following answer: The level of a plus 1 // The level of e height of a nonempty concepts of tree are true: node is the length of the path from the root to the node a node must be between 1 and the height of the tree // Th is the maximum level of a node in the tree.  
  
Which of the following statements are true: anwer: Polish notation eliminates all parentheses from formulas // Using Polish notation, all expressions have to be broken down unambiguously into separate ope  
  
rations and put into their proper order // Expression trees do not use parentthe s Select incorrect statement: answer: Morris's algorithm does not temporarily change tree structure // A Recur sive implementation of preorder tree traversal uses stack explicitly // Depth-fi rst traversal can not be implemented if not using stack Which of the following statements about heap are false: answer: Heap represented by array can be traversed eaily in depth-first // A hea p can be defined as an array heap of length n in which Consider below recursive define about tree:1.An empty structures is an empty tre e.2. If t1,..,tk are disjointed trees ,then the structure whose root has its chi ldren the root t1,..,tk is also a treeanswer: true answer: true In all binary trees, there are 2^i nodes at level i. answer: false Which of the following methods are used to traverse a tree without using any sta ck or threads: answer: Traversal through Tree Transformation Which operation is used in DSW Algorithm: answer: Rotation Select correct statement: answer: The complexity of searching depends on the shape of the treee and the po sition of the node in the tree // For a binary tree with n nodes, there are n! d ifferent traversals// Breath-First traversal is implemented using queue Which of the following methods are used for Depth-First Traversal answer:All of others Which of the following statement about finding the shortest path is false: answer: The complexity of WFI's algorithms is |V^3| that is good efficiency for any graph // WFI's algorithm doesn't allows detecting cycles in graph Which of the following statements about graph coloring is true: answer: The chromatic number of the cycle graph K100 is 100 // In Brelaz's algo rithm, the loop "For each uncolored vertex u adjacent to v" takes O(|V|) Most of the label-setting and label-correcting methods are used to find the shor test paths from one vertex to all other vertices: answer:True Which graph representation is best? answer: It depends on the problem. Which of the following statements about finding the shortest path are true: answer: The methods solving the shortest path problems are divided into classes: label-setting and label-correcting // For label-setting methods ,in each pass t hrough the vertices still to be processed, one vertex is set to value that remai ns unchanged to the end of the execution. Which of the following statements about graph coloring is true: answer: Sequential Coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them // The complexity of sequential Coloring algorith is O(|V^2|)  
  
Which of the following are false: answer: A graph from v1 to vn is a sequence of edges (v1v2), edges (v2v3)...edge s (vn-1vn) and no edge is repeated // A circuit is a cycle in which all vertices must be different Which of the following statements about finding the shortest path are true: answer: The complexity of Dijkstra's algorithm is O(|V|^2) // The complexity of Ford's algorithm is O(|V||E|) for any graph (?) // The complexity of Dijkstra's algorithm using the heap is O((|E| + |V|)lg|V|) // For label-correcting method, information of any label can be changed during application of method Which of the following statement about spanning tree is false: answer: None of the others Which of the following statement about spanning tree is true: answer: All of the others (The complexity of Kruskal's algorithm depends on the complexity of the sorting method applied // The complexity of Kruskal's algorith m depends on the method used for cycle detection. Which of the following statements about elementary sorting is true: answer: None of the others Which of the following statements about efficient sorting is true: answer:Mergersort can be made more efficient by replacing recursion with iterati on // insertion sort is applied to small portions of an array to improve perform ance In Insertion Sort, the number of movements and comparisons for a randomly orded array is closer to the beast case. answer:False Which of the following statements about efficient sorting is true: answer: All of the others (Heap sort starts from the end of array by finding the largest elements // In heap sort, for the best case the number of calling moveD own() in the first loop is n/2) Select correct statements about Radix sort: answer: bitRadixsort() can be improved by implementing array insted of using que ue // One of techniques radix sort uses is by looking at each number as a string of bits so that all integers are euqal length In insertion sort algorithm, the number of times variable tmp is loaded and unlo aded in the outer for loop is not: answer: None of the other Which of the following statements about Quich sort is true: answer: Quick sort is recursive in nature // A strategy for selecting a bound is to choose the element located in the middle of the array Which of the following statements about efficient sorting is true: answer: Shell sort is more efficient than insertion sort even if in case there a re only two increments // There is no sequence of increments it optimal In sertion sort, which case is only one comparison made for each position i: answer: The data are already in order Which of the following statements about elementary sorting is true: answer:Advantage of using insertion sort is that it sorts the array only when is really necessary  
  
Select correct statements: answer: The characteristic feature of extendible hashing is the organization of the index ,which is an expendable table // A reorganization of the file is avoid ed by using extendible hashing if the directory overflows. Which of the following statement about Perfect Hash Functions are true: answer: In a minimal perfect hash function, wasting time for collision resolutio n and wasting space for unused table cells are avoided // The function in FHCD a lgorithm is found in three steps: mapping ,ordering and searching Which of the following statement about Perfect Hash Functions are true: answer: Cihcelli's method uses an exhaustive search // Cichelli's method is used to hash relatively small number of reserved Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. answer: True Which of the following statement is true: answer: If hash function transforms different keys into different numbers, it is called a perfect hash function Which of the following statement about Open Addressing are false: answer: In linear probing of the open addressing method, the position in which k ey can be stored is found by sequentially searching starting from the begin of t able // Using qadratic probling gives much better results than linear probing an d avoids the problem of cluster buildup Which of the following statement are true: answer: Coalesced hashing combine linear probing with chaining // Linked list ca n be used in Bucket Addressing Which of the following statement are false: answer: In chaining ,searches always fast if using linked list // Self-organizin g linked lists do not improve performance in chaining. Which of the following statement are false: answer: The best value of divisor can be any // The folding method ( instead of division method) is the preferred choice for the hash function if very little is know about the keys. Which of the following statement are true: answer: If there are 32 items and a 64-cel table then there are 8^64 hash functi ons // The divsion method depends on division modulo // Good value for m are pri me numbers that are not very close powers of 2 Select correct statements: answer: In shifting folding method (+ boundary folding) the key is usually divid ed into even parts of some fixed size plus some remainder and added // The bound ary folding method is applied to number data. Select correct statements: answer: In practice ,the mid-square method is more efficient to the size of tabl e that is power of 2// The middle part of bit representation of the square of a key is extracted using a mask and a shift operation The length of the codeword for a given sysbol mj should not less than the length of the codeword of a less probable symbol mi; that is,if P(mi)<=P(mj), then L(m  
  
i)<=L(mj) for 1<=i, j<=n answer: false Select correct statement about Ziv-Lempei Code. answer: All of the others (The codeword of Ziv-Lempei Code is a triple // Ziv-Le mpei Code uses buffer of symbols) Entropy of source M is defined by: answer: False Select correct statement about Run-length encoding. answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs Select incorrect statements about Huffman Coding: answer: Huffman tree is only implemented by non-recursive algorithm // Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list o f nodes with nonincreasing frequency counter Select correct statements about Huffman Coding: answer: David Huffman's algorithm is not useful for sending some specialized fil es // Huffman tree can be built top-down Each codeword corresponds to one or more symbols. answer: False Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique. answer: flase ///////nay la ly thuyet A Java program is a sequence of statements that have to be formed in accordance with the predefined syntax. A statement is the smallest executable unit in Java. Compound statements, or blocks, are marked by delimiting them with braces, { and }. A class is a template in accordance to which objects are created. Functions defined in a class are called methods. Variables used in a class are called class scope variables, data fields, or fiel ds. The combination of data and related operations is called data encapsulation. An object is an instance of a class, an entity created using a class definition. An item specified in terms of operations is called an abstract data type. Subclasses, or derived classes, inherit the fields and methods from their base c lass so that they do not have to repeat the same definitions. Polymorphism is the ability of acquiring many forms. In many languages, pointer is a technical term for a type of variable; in Java, the term reference is used instead.  
  
A vector is a data structure with a contiguous block of memory, just like an arr ay. A linked structure is a collection of nodes storing data and links to other node s. A linked list is a data structure composed of nodes, each node holding some info rmation and a reference to another node in the list. A singly linked list is a node that has a link only to its successor in this seq uence. A circular list is when nodes form a ring: The list is finite and each node has a successor. A skip list is a variant of the ordered linked list that makes a nonsequential s earch possible. There are four methods for organizing lists: move-to-front method, transpose me thod, count method, and ordering method. Optimal static ordering - all the data are already ordered by the frequency of t heir occurrence in the body of data so that the list is used only for searching, not for inserting new items. A sparse table refers to a table that is populated sparsely by data and most of its cells are empty. Linked lists allow easy insertion and deletion of information because such opera tions have a local impact on the list. The advantage of arrays over linked lists is that they allow random accessing. A stack is a linear data structure that can be accessed at only one of its ends for storing and retrieving data. A stack is called an LIFO structure: last in/first out. A queue is a waiting line that grows by adding elements to its end and shrinks b y taking elements from its front. A queue is an FIFO structure: first in/first out. InÂ queuing theory, various scenarios are analyzed and models are built that use qu eues forÂ processingÂ requests or otherÂ informationÂ in a predetermined sequence (order). A priority queueÂ can be assigned to enable a particular process, or event, to be e xecuted out of sequence without affecting overall system operation. In priority queues, elements are dequeued according to their priority and their current queue position. Recursive definitions are programming concepts that define themselves Recursive definitions serve two purposes: Generating new elements Testing whether an element belongs to a set  
  
Recursive definitions are frequently used to define functions and sequences of n umbers Tail recursion is characterized by the use of only one recursive call at the ver y end of a method implementation. Backtracking is a technique for returning to a given position (e.g., entry point ) after trying other avenues that are unsuccessful in solving a particular probl em. The process of translating one executable statement at a time and immediately ex ecuting it is called interpretation. A tree is a data type that consists of nodes and arcs. The root is a node that has no parent; it can have only child nodes. Each node has to be reachable from the root through a unique sequence of arcs, c alled a path. An orderly tree is where all elements are stored according to some predetermined criterion of ordering. A binary tree is a tree whose nodes have two children (possibly empty), and each child is designated as either a left child or a right child. A decision tree is a binary tree in which all nodes have either zero or two none mpty children. Tree traversal is the process of visiting each node in the tree exactly one time . Threads are references to the predecessor and successor of the node according to an inorder traversal. An AVL tree is one in which the height of the left and right subtrees of every n ode differ by at most one. A modification of the move-to-the-root strategy is called splaying. Polish notation is a special notation for propositional logic that eliminates al l parentheses from formulas. A graph is a collection of vertices (or nodes) and the connections between them A multigraph is a graph in which two vertices can be joined by multiple edges A pseudograph is a multigraph with the condition vi ? vj removed, which allows f or loops to occur The sets used to solve the union-find problem are implemented with circular link ed lists A spanning tree is an algorithm that guarantees generating a tree (or a forest, a set of trees) that includes or spans over all vertices of the original graph An undirected graph is called connected when there is a path between any two ver tices of the graph  
  
A network is a digraph with one vertex s, called the source, with no incoming ed ges, and one vertex t, called the sink, with no outgoing edges Maximum matching is a matching that contains a maximum number of edges so that t he number of unmatched vertices (that is, vertices not incident with edges in M) is minimal A Hamiltonian cycle in a graph is a cycle that passes through all the vertices o f the graph Sequential coloring establishes the sequence of vertices and a sequence of color s before coloring them, and then color the next vertex with the lowest number po ssible Sorting is a two step process: Choose the criteria that will be used to order da ta and determine how to put a set of data in order using that criterion An insertion sort starts by considering the two first elements of the array data , which are data[0] and data[1] Selection sort is an attempt to localize the exchanges of array elements by find ing a misplaced element first and putting it in its final place A decision tree is when nonterminal nodes of the tree contain conditions or quer ies for labels, and the leaves have all possible orderings of the array to which the algorithm is applied Shell sort divides the original array into subarrays, sorting them separately, a nd then dividing them again to sort the new subarrays until the whole array is s orted Mergesort makes partitioning as simple as possible and concentrates on merging s orted halves of an array into one sorted array Radix sort is a a technique to sort integers by proceeding right to left Java provides two sets of versions of sorting methods: one for arrays and one fo r lists Hash functions include the division, folding, mid-square, extraction and radix tra nsformation methods Collision resolution includes the open addressing, chaining, and bucket addressi ng methods Cichelli s method is an algorithm to construct a minimal perfect hash function The FHCD algorithm searches for a minimal perfect hash function of the form (mod ulo TSize), where g is the function to be determined by the algorithm In expandable hashing and dynamic hashing, a binary tree is used as an index of buckets In extendible hashing, a directory of records is kept in a table A hash map is a collection of singly linked lists (buckets); that is, chaining i s used as a collision resolution technique HashSet is another implementation of a set (an object that stores unique elements )  
  
A Hashtable is roughly equivalent to a HashMap except that it is synchronized an d does not permit null values with methods to operate on hash tables To compare the efficiency of different data compression methods when applied to the same data, the same measure is used; this measure is the compression rate The construction of an optimal code was developed by David Huffman, who utilized a tree structure in this construction: a binary tree for a binary code In adaptive Huffman coding, the Huffman tree includes a counter for each symbol, and the counter is updated every time a corresponding input symbol is being cod ed A run is defined as a sequence of identical characters Run-length encoding is useful when applied to files that are almost guaranteed t o have many runs of at least four characters, such as relational databases Null suppression compresses only runs of blanks and eliminates the need to ident ify the character being compressed The Ziv-Lempel code is an example of a universal data compression code /////////////////////////////////SE0570 //////////// - Static methods and variables are associated with the class itself and are cal led instance methods and instance Answer:variables - The combination of data and related operations is called inf ormation hiding principle 2. Which of the following keywords are access modifier: Answer:- Protected - Private 3. Select correct statements: Answer:- Subclasses or derived classes inherit the fields and methods from thei r base class - An abstract data type can be part of a program in the form of an interface 4. Which of the following statements are true: Answer:- AN object can be saved in a life if its class type is stated to implem ent in the Serializable interface - If the vector s capacity is greater than its size, then a new element can be inserted at the end of the vector immediately 5. Which of sentences about singly linked list are true: Answer:- Deleting a node at the beginning of the list takes constant time O(1) - On the average, delete operation executes O(n) steps - There is no immediate access to the predecessor of any node in list 6. Select correct statement(s) about Doubly Answer:- The node which is deleted from the collection - Deleting a node at the end of Processing for adding a node to the end of Linked List: list will be claimed by the garbage the list takes constant time O(1) list includes six steps  
  
7. Select incorrect statements about skip list: Answer:- None of the others: + In a skip list of n nodes, for each k and I such that and , the node in position 2k-1 .i points to the node in position 2k-1 .(i+1)  
  
+ The number of reference fields indicates the level of each node, and the numbe r of levels is maxLevel = 8. Select incorrect statement about skip list: Answer:- The search time is O(lgn) in the worst case - In 20-element skip list s, the node in position 3 points to the node in position 7 9. Select false statement: Answer:- In the array list, poping is executed in O(lgn) to the worst case 10. Select true statements about stack: Answer:- The Java implementation of the stack is potentially fatal - Stack can be implemented by linked list 11. Which of the following methods of queue are true: Answer:- isEmpty() Check to see if the queue is empty - enqueue(el) Put the el ement el at the end of the queue - firstEl() Return the first element in the qu eue without removing it 12. Which of the following can be executed in constant time O(n) Answer:- When deleting a node of a singly linked list in the average case - Wh en deleting a node of a singly linked list in the worst case 13. Which of the following statements are true: Answer:- The recursive version increases program readability, improves self-doc umentation and simplifies coding 14. When converting a method from a recursive version into an iterative version, Answer:- The brevity of program formulation lost. However, the brevity may not be an issue in Java - Program clarity can be diminished 15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system. Answer:- True 16. In all cases, nonrecursive implementation is faster recursive implementation . Answer:- False 17. Which of the following concepts of tree are true: Answer:- The height of a nonempty tree is the maximum level of a node in the tr ee - The level of a node is the length of the path from the root to the node pl us 1 - The level of a node must be between 1 and height of the tree 18. Select correct statement: Answer:- For a binary tree with n nodes, there are n! different traversals - T he complexity of searching depends on the shape of the tree and the position of the node in the tree - Breath-First traversal is implemented using queue 19. Select incorrect statement Answer:- Depth-first traversal can not be implemented if not using stack - A r ecursive implementation of preorder tree traversal uses stack explicitly - Ther e are six possible ordered depth-first traversal 20. Which of the following statements are true: Answer:- Polish notation eliminates all parentheses from formulas - Using Poli sh notation, all expressions have to be broken down unambiguous into separate op  
  
erations and put into their proper order. - Expression trees do not use parenth eses 21. Which of the following sentences are true: Answer:- The complexity of DFS is O(|V| + |E|), where |V| is number of vertices and |E| is number of edges - To prevent loop from happen in an algorithm for t raversing a graph, each visited vertex can be marked 22. Which of the following statements about finding the shortest path are true: Answer:- For label-correcting method, information of any label can be changed d uring application of method - The complexity of Dijkstra s algorithm is O(|V| The complexity of Ford s algorithm is O(|V||E|) for any graph 23. Which of the following statement about spanning tree is false: Answer:- None of the others: + The complexity of Kruskal s algorithm depends on t he complexity of the sorting method applied + The complexity of Kruskal s algorithm depends on the method used cycle detection 24. Which of the following statements about graph coloring is true: Answer:- The complexity of sequential Coloring algorithm is O(|V|2- Sequential Coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them 25. Which of the following statements about efficient sorting is false: Answer:- Shell sort divides the original array into physical subarrays, sorting them separately, then merging and dividing them again to sort the new subarray until the whole array is sorted 26. Which of the following statements about efficient sorting is false: Answer:- The worst case is when the bound divides an array into subarrays of ap proximately length - The best case of quick sort happens when bound is the la rgest (the smallest) element of the array 27. Which of the following statements is true: Answer:- All of the others: + All the sorting methods implemented in Java is ap plied to any basic data type + For objects comparison, a comparison criterion mu st be implemented by user for all claases 28. In Insertion Sort, the number of movements and comparison for a randomly ord ered array is closer to the best case. Answer:- False 29. Which of the following statement about Open Addressing are false: Answer:- In linear probing of the open addressing method, the position in which key can be stored is found by sequentially searching starting from the begin of table - Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup 30. Which of the following statement are true: Answer:- Linked list can be used in Bucket Addressing - Self-organizing linked lists can be used improve performance in chaining - Coalesced hashing combines linear probing with chaining 31. Which of the following statement about Perfect Hash Functions are true: Answer:- Cichelli s method uses an exhaustive search - Cichelli s method is used t  
  
o hash relatively small number of reserved words 32. Select correct statements: Answer:- A reorganization of the file is avoided by using extendible hashing if the directory overflows - The characteristic feature of extendible hashing is the organization of the index, which is expandable table 33. Which of the following data structure can be implemented Huffman Coding Answer:- Singly linked list - Priority queue - Doubly linked list 34. Select incorrect statements about Huffman Coding: Answer:- Huffman tree is only implemented by non-recursive algorithm - David H uffman s algorithm may not be useful for sending some specialized files - Adaptiv e Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter 35. Select correct statement about Run-length encoding. Answer:- A serious drawback of run-length encoding is that it relies entirely o n the occurrences of runs 36. Identify whether below code has error or not: Abstract class AC1{ Int AC1f1() {return 0;} Void AC1f2(int i) {return;} Int AC1f3(); } Answer:- Compile error 37. Identify whether below code has error or not: Interface I2{ Double I2f1(); Void I2f1(); Double I2f3() {return 10;} Int n = 10; Private double m; } Answer:- 3 compile errors 38. Class C{ Void process1(char ch)( .) Void process2(char ch)( .) Void process3(char ch)( .) } Class ExtC extends C{ Void process1(int n)() Void process2(char ch)() Void process4(int n)() } ExtC object1 = new ExtC(); C object2 = new ExtC(), object3 = new ExtC(); Which of the following statements are true Answer:- Object1.process2( N ) calls process2 of class ExtC - Object2.process1(1) does not issue compile error - Object2.process3( N ) call process3 of class C 39. For (int I = first, j; I <= last; i++) { Int tmp = data[i]; For (j=I; j>0 && tmp   
Data[j] = tmp; } Identify which algorithm the above code implements Answer:- Insertion Sort 40. Public > void XYZsort (T[] data) { For (int i=0 ; iI; --j) If (data[j].compareTo(data[j-1])<0) Swap(data,j,j-1); } Identify which algorithm the above code implements Answer:- Bubble sort 41. Public static void reverse() { Char ch=getChar(); If(ch!= \n ) { Reverse(); System.out.print(ch); } } Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n 42. Void nontail(int i) { If(i>0) { Nontail(i+1); System.out.print(i+ ); Nontail(i+1); } } What is output if nontail is called with i=3 Answer:- Runtime error is issued 43. Void nontail(int i) { If(i>0) { Nontail(i-2); System.out.print(i+ ); Nontail(i-2); } } What is output if nontail is called with i=5 Answer:- 1315131 44. Protected void preorderVRL(BSTNode p) { If (p!=null { Visit(p); preorderVRL(p.right); preorderVRL(p.left); } } What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image:  
  
Answer:- 2 6 3 15 8 10 1 11 12 45. What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: Answer:- 2 6 8 3 15 10 1 11 12 46. Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer:- {2,4,5,8,9,10,3} 47. Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for loo completed Answer:- {19,18,14,6,5,10,15} 48. Let deleteFromHead be method used to delete the first element of generic sin gly linked list class: Identify whether above code has error or not: Answer:- There may be runtime error in some case 49. Identify whether the code of pop method has error or not: Answer:- There may be runtime error in some case 50. Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n Answer:- \nFEDCBA 51. Which of the following about queue are true: Answer:- A queue is an FIFO structure 52. Which of the following statement of queue are true Answer:- All of the others: + Using array for queue implementation may not be t he best choice + A natural queue implementation is a linked list 53. Select false statement: Answer:- In the array list, poping is executed in time O(n) to the worst case 54. In the doubly linked list implementation, enqueuing can be executed in time O(n) Answer:- False 55. Which of the following statements about heap are false: Answer:- Heaps represented by array can be travered easily in depth-first - A heap can be defined as an array heap of length n in which: - Heaps can be imple mented by arrays 56. Consider below recursive define about tree: 1. An empty structure is an empty tree. Answer:- True  
  
57. Which of the following statements about elementary sorting is true: Answer:- None of the others + In selection sort, for every iteration j of the i nner for loop, there are n-i+1 comparisons + The worst case of selection sort ha s n-1 swap calls 58. Which of the following statements about efficient sorting is true: Answer:- Insertion sort is applied to small portions of an array to improve per formance - Mergesort can be made more efficient by replacing recursion with ite ration 59. Select correct statements about Radix sort: Answer:- bitRadixsort() can be improved by implementing array instead of using queue - One of techniques radix sort uses is by looking at each number as a str ing os bits so that all integers are of equal length. 60. Which of the following statement is true: Answer:- If hash function transforms different keys into different numbers, it is called a perfect hash function 61. Select correct statements: Answer:- In shift folding method, the key is usually divided into even parts of some fixed size plus some remainder and added - The boundary folding method is applied to number data 62. Which of the following statements are false: Answer:- The best value of divisor can be any - The folding method is the pref erred choice for the hash function if very little is known about the keys 63. Each codeword corresponds to one or more symbols Answer:- False 64. Run-length encoding is very efficient for text file in which only blank char acter has a tendency to be repeated without using any technique Answer:- True 65. Select correct statement about Ziv-Lempel Code Answer:- All of the others: + Ziv-Lempel Code uses buffer of symbols + The code word of Ziv-Lempel Code is a triple 66. The length of the codeword for a given symbol mj should not less than the le ngth of the codeword of a less probable symbol m; that is, if then for Answer:- False 67. In the array implementation, enqueuing can be executed in constant time O(1) Answer:- True 68. Which of the following about stack are true: Answer:- The most top element is the latest added element - Operations of stac k based on Last in First out structure 69. In the array implementation, dequeuing can be executed in O(n) Answer:- False 70. Which of the following about queue are true: Answer:- A queue is an FIFO structure 71. Select incorrect statement: Answer:- The anchor or ground case allows for the construction of new objects o  
  
ut of basic elements or objects that have already been constructed 72. What is the value of h(1): Answer:- 14 73. What is the value of A(3,1): Answer:- 15 74. In all binary trees, there are 2i nodes at level i. Answer:- False 75. Which of the following methods are used to traverse a tree without using any stack or threads: Answer:- Traversal through tree Transformation 76. Which operation is used in DSW Algorithm: Answer:- Rotation 77. Which of the following are false: Answer:- A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) edges( vn-1vn) and no edge is represented - A circuit is a cycle in which all vertices must be different 78. Which graph representation is best? Answer:- It depends on the problem 79. Which of the following statements about finding shortest path are true: Answer:- For label-setting methods, in each pass through the vertices still to be processed, one vertex is set to a value that remains unchanged to the end of the execution - The methods solving the shortest path problem are divided into classes; label-setting and label-correcting 80. Which of the following statements about graph coloring is true: Answer:- Sequential coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them. - The complexity of sequential Color ing algorithm is O(|V| 2 ) 81. Which of the following statement about finding the shortest path is false: Answer:- The complexity of WFI s algorithm is |V| 3 that is good efficiency for any graph 82. In insertion sort algorithm, the number of times variables tmp is loaded and unloaded in the outer for loop is not: Answer:- All of the others: + Necessary in the worst case + Redundant in the be st case 83. Which of the following statements about Quick sort is true: Answer:- Quick sort is recursive in nature - A strategy for selecting a bound is to choose the element located in the middle of the array 84. Skip list helps avoiding sequential search Answer:- True 85. Select correct statement(s): - A singly linked list is a nod e that has a link only to its successor in this sequence - Inserting a new node at the end of the singly linked list without tail field requires steps with n i  
  
s the number of nodes 86. Which of the following operations are implemented in the LinkedList class be longs to the java.util package: Answer:- All of the others: + Return the copy of the linked list without clonin g its elements + Add all the elements from one collection to the beginning of th e linked list 87. Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are managed by the heads and tails. The complexity of direct concatenating L2 to L1 is Answer:- O(1) 88. Which of the following operations are not implemented in the ArrayList class belongs to the java.util package: Answer:- None of the others: + Remove the object at given position + Copy all o bjects from the array list to a newly created array 89. Elements of a linked list must be consecutive memory cells Answer:- False 90. If an algorithm is constantly accessing only some elements such as the first , the second, the last and the like, and if changing the structure is very impor tant to the algorithm then solution is using: Answer:- Linked list 91. The advantages of array over linked lists is that they allow random accessin g Answer:- True 92. Which of the following operations are implemented in the ArrayList class bel ongs to the java.util package: Answer:- All of the others: + Update one element in any position in the ArrayLi st + Add one element to any position in the ArrayList + Retrieve one element fro m any position in the ArrayList 93. Linked lists allow easy insertion and deletion of information because such o perations have a local impact on the list Answer:- True 94. In the doubly linked list implementation, dequeuing can be executed in const ant time O(1) Answer:- True 95. Which of the following methods of queue are true: Answer:- Enqueue(el) Put the element el at the end of the queue - Dequeue() ke the first element from the queue 96. Consider the following recursive function, assuming n is even: What is the value of h(20): Answer:- 11 97. Which of the following statements are false: Answer:- An activation record still exists after a method owning it ends - An activation record contains code of method owning it 98. Which of the following statements about graph coloring is true: 99. Most of the label-setting and label-correcting are used to find the shortest paths from Ta  
  
one vertex to all other vertices Answer:- False 100. Which of the following statements about Perfect Hash Functions are true: Answer:- In a minimal perfect hash function, wasting time for collision resolut ion and wasting space for unused table cells are avoided - The functioning in H CD algorithm is found in three steps: mapping, ordering and searching 101. Hash function is function that can transform a particular key (K) (a strin g, number or record) into an index in the table used for storing items of the sa me type as K. Answer:- True 102. Entropy of source M is defined by: Answer:- false 103. Which of the following operations are not implemented in the ArrayList cla ss belongs to the java.util package: Answer:- Return the sub list of the array list containing copy of elements in t he array list 104. Insertion sort which case is only one comparison made for each position i: Answer:- The data are already in order 105. What are number of additions and number of calls to find Fib(8) using recu rsive definition Answer:- 33 and 67 106. Which of the following statements about Quick sort is true: Answer:- A strategy for selecting a bound is to choose the element located in t he middle of the array - Quick sort is recursive in nature 107. Which of the following statements about elementary sorting is true Answer:- Advantage of using insertion ort that it sorts the array only when is really necessary 108. Select correct Answer:- The middle tracted using a mask is more efficient to statements: part of the bit representation of the square of a key is ex and a shift operation- In practice, the mid-square method the size of table that is a power of 2  
  
Which of the following keywords are access modifier: answer: Protected + Private Select correct statements: answer:1.Subclasses or derived classes inherit the fields and methods from their base class 2.An abstract data type can be part of a program in the form of an interface Which of the following statements are true: answer:1.AN object can be saved in a life if its class type is stated to impleme nt in the Serializable interface 2.If the vector s capacity is greater than its s ize, then a new element can be inserted at the end of the vector immediately Which of sentences about singly linked list are true: answer:1.Deleting a node at the beginning of the list takes constant time O(1)  
  
2.On the average, delete operation executes O(n) steps 3.There is no immediate access to the predecessor of any node in list Select correct statements about Doubly Linked List: answer:1.The node which is deleted from the list will be claimed by the garbage collection 2.Deleting a node at the end of the list takes constant time O(1) 3 .Processing for adding a node to the end of list includes six steps Select incorrect statements about skip list: answer:none of the others Select incorrect statement about skip list: answer:1.The search time is O(lgn) in the worst case 2.In 20-element skip lists , the node in position 3 points to the node in position 7 Select false statement: answer:In the array list, poping is executed in O(lgn) to the worst case Select true statements about stack: answer:1.The Java implementation of the stack is potentially fatal 2.Stack can be implemented by linked list Which of the following methods of queue are true: answer:1.isEmpty() - Check to see if the queue is empty 2.enqueue(el) - Put the element el at the end of the queue 3.firstEl() - Return the first element in t he queue without removing it Which of the following can be executed in constant time O(n) answer:1.When deleting a node of a singly linked list in the average case 2.Whe n deleting a node of a singly linked list in the worst case Which of the following statements are true: answer:The recursive version increases program readability, improves self-docume ntation and simplifies coding When converting a method from a recursive version into an iterative version: answer:1.The brevity of program formulation lost. However, the brevity may not b e an issue in Java 2.Program clarity can be diminished Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. answer:True In all cases, nonrecursive implementation is faster recursive implementation. answer:False Which of the following concepts of tree are true: answer:1.The height of a nonempty tree is the maximum level of a node in the tre e 2.The level of a node is the length of the path from the root to the node plu s 1 3.The level of a node must be between 1 and height of the tree Select correct statement: answer:1.For a binary tree with n nodes, there are n! different traversals 2.Th e complexity of searching depends on the shape of the tree and the position of t he node in the tree 3.Breath-First traversal is implemented using queue Select incorrect statement: answer:1.Depth-first traversal can not be implemented if not using stack 2.A re cursive implementation of preorder tree traversal uses stack explicitly 3.There are six possible ordered depth-first traversal  
  
Which of the following statements are true: answer:1.Polish notation eliminates all parentheses from formulas 2.Using Polis h notation, all expressions have to be broken down unambiguous into separate ope rations and p into their proper order. 3.Expression trees do not use parenthese s Which of the following sentences are true: answer:1.The complexity of DFS is O(|V| + |E|), where |V| is number of vertices and |E| is number of edges 2.To prevent loop from happen in an algorithm for tr aversing a graph, each visited vertex can be marked Which of the following statements about finding the shortest path are true: answer:1.For label-correcting method, information of any label can be changed du ring application of method 2.The complexity of Dijkstra s algorithm is O(|V|2) 3 .The complexity of Ford s algorithm is O(|V||E|) for any graph Which of the following statement about spanning tree is false: answer:none of the others Which of the following statements about graph coloring is true: answer:1.The complexity of sequential Coloring algorithm is O(|V|2) 2.Sequenti al Coloring algorithm establishes the sequence of vertices and a sequence of col or before coloring them Which of the following statements about efficient sorting is false: answer:Shell sort divides the original array into physical subarrays, sorting th em separately, then merging and dividi them again to sort the new subarray until the whole array is sorted Which of the following statements about efficient sorting is false: answer:1.The worst case is when the bound divides an array into subarrays of app roximately length n/2 2.The best case of quick sort happens when bound is the l argest (the smallest) element of the array Which of the following statements is true: answer:All of the others In Insertion Sort, the number of movements and comparison for a randomly ordered array is closer to the best case. answer:False Which of the following statement about Open Addressing are false: answer:1.In linear probing of the open addressing method, the position in which key can be stored is found by sequentially searching starting from the begin of table 2.Using quadratic probing gives much better results than linear probing a nd avoids the problem Which of the following statement are true: answer:1.Linked list can be used in Bucket Addressing 2.Self-organizing linked lists can be used improve performance in chaining 3.Coalesced hashing combines linear probing with chaining Which of the following statement about Perfect Hash Functions are true: answer:1.Cichelli s method uses an exhaustive search 2.Cichelli s method is used to hash relatively small number of reserved words Select correct statements: answer:1.A reorganization of the file is avoided by using extendible hashing if the directory overflows 2.The characteristic feature of extendible hashing is t  
  
he organization of the index, which is expandable table Which of the following data structure can be implemented Huffman Coding answer:1.Singly linked list 2.Priority queue 3.Doubly linked list Select incorrect statements about Huffman Coding: answer:1.Huffman tree is only implemented by non-recursive algorithm 2.David Hu ffman s algorithm may not be useful for sending some specialized files 3.Adaptive Huffman coding uses breath-first left-to-right tree traversal generates a list of nodes with nonincreasing frequency counter Select correct statement about Run-length encoding. answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs Identify whether below code has error or not: answer:Abstract class AC1{ Int AC1f1() {return 0;} Void AC1f2(int i) {return;} I nt AC1f3(); } Compile error Identify whether below code has error or not: answer:Interface I2{ Void I2f1(); Double I2f3() {return 10;} Int n = 10; Private double m;}-3 compile errors Which of the following statements are true answer:1.Object1.process2( N ) calls process2 of class ExtC 2.Object2.process1(1) d oes not issue compile error 3.Object2.process3( N ) call process3 of class C Identify which algorithm the above code implements answer:For (int I = first, j; I <= last; i++) { - Insertion Sort Identify which algorithm the above code implements answer:Public > void XYZsort (T[] data) - Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n answer:FEDCBA What is output if nontail is called with i=3 answer:Runtime error is issued What is output if nontail is called with i=5 answer:1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: answer:2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: answer:2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for lo completed answer:19,18,14,6,5,10,15  
  
Let deleteFromHead be method used to delete the first element of generic singly linked list class: answer:There may be runtime error in some case Identify whether the code of pop method has error or not: answer:There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n answer:\nFEDCBA Which of the following about queue are true: answer:A queue is an FIFO structure Which of the following statement of queue are true answer:All of the others Select false statement: answer:In the array list, poping is executed in time O(n) to the worst case In the doubly linked list implementation, enqueuing can be executed in time O(n) answer:False Which of the following statements about heap are false: answer:1.Heaps represented by array can be travered easily in depth-first 2.A h eap can be defined as an array heap of length n in which: 3.Heaps can be implem ented by arrays Consider below recursive define about tree: 1.An empty structure is an empty tre e. answer:True Which of the following statements about elementary sorting is true: answer:None of the others Which of the following statements about efficient sorting is true: answer:1.bitRadixsort() can be improved by implementing array instead of using q ueue 2.One of techniques radix sort uses is by looking at each number as a stri ng os bits so that all integers are of equal length. Which of the following statement is true: answer:If hash function transforms different keys into different numbers, it is called a perfect hash function Select correct statements: answer:1.In shift folding method, the key is usually divided into even parts of some fixed size plus some remainder an added 2.The boundary folding method is a pplied to number data Which of the following statements are false: answer:1.The best value of divisor can be any 2.The folding method is the pref erred choice for the hash function if very little is known about the keys Each codeword corresponds to one or more symbols answer:False Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique answer:True  
  
Select correct statement about Ziv-Lempel Code answer:All of the others The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol m; that is, answer:False In the array implementation, enqueuing can be executed in constant time O(1) answer:True Which of the following about stack are true: answer:1.The most top element is the latest added element 2.Operations of stack based on Last in First out structure In the array implementation, dequeuing can be executed in O(n) answer:False Which of the following about queue are true: answer:A queue is an FIFO structure Select incorrect statement: answer:The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed What is the value of h(1): answer:14 What is the value of A(3,1): answer:15 In all binary trees, there are 2i nodes at level i. answer:False Which of the following methods are used to traverse a tree without using any sta ck or threads: answer:Traversal through tree Transformation Which operation is used in DSW Algorithm: answer:Rotation Which of the following are false: answer:1.A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) edges(v n-1vn) and no edge is represented 2.A circuit is a cycle in which all vertices must be different Which graph representation is best? answer:It depends on the problem Which of the following statements about finding shortest path are true: answer:1.For label-setting methods, in each pass through the vertices still to b e processed, one vertex is set to a value that remains unchanged to the end of t he execution 2.The methods solving the shortest path problem are divided into c lasses; label-setting and label-correcting Which of the following statements about graph coloring is true: answer:1.Sequential coloring algorithm establishes the sequence of vertices and a sequence of color before coloring them. 2.The complexity of sequential Colori ng algorithm is O(|V|2) Which of the following statement about finding the shortest path is false:  
  
answer:The complexity of WFI s algorithm is |V|3 that is good efficiency for any g raph In insertion sort algorithm, the number of times variables tmp is loaded and unl oaded in the outer for loop is not: answer:All of the others Which of the following statements about Quick sort is true: answer:1.Quick sort is recursive in nature 2.A strategy for selecting a bound i s to choose the element located in the middle of the array Select correct statement(s): answer:1.A singly linked list is a node that has a link only to its successor in this sequence 2.Inserting a new node at the end of the singly linked list with out tail field requires steps with n is the number o nodes Which of the following operations are implemented in the LinkedList class belong s to the java.util package: answer:All of the others Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are man aged by the heads and tails. complexity of direct concatenating L2 to L1 is answer:O(1) Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package: answer:None of the others Elements of a linked list must be consecutive memory cells answer:False If an algorithm is constantly accessing only some elements such as the first, th e second, the last and the like, a if changing the structure is very important t o the algorithm then solution is using: answer:Linked list The advantages of array over linked lists is that they allow random accessing answer:True Which of the following operations are implemented in the ArrayList class belongs to the java.util package: answer:All of the others Linked lists allow easy insertion and deletion of information because such opera tions have a local impact on the answer:True In the doubly linked list implementation, dequeuing can be executed in constant time O(1) answer:True Which of the following methods of queue are true: answer:1.Enqueue(el) - Put the element el at the end of the queue 2.Dequeue() Take the first element from the queue What is the value of h(20): answer:11 Which of the following statements are false: answer:1.An activation record still exists after a method owning it ends 2.An a  
  
ctivation record contains code of method owning it Most of the label-setting and label-correcting are used to find the shortest pat hs from one vertex to all other vertices answer:False Which of the following statements about Perfect Hash Functions are true: answer:1.In a minimal perfect hash function, wasting time for collision resoluti on and wasting space for unused table cells are avoided 2.The functioning in HC D algorithm is found in three steps: mapping, ordering and searching Hash function is function that can transform a particular key (K) (a string, num ber or record) into an inde the table used for storing items of the same type as K. answer:True Entropy of source M is defined by: answer:False Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package: answer:Return the sub list of the array list containing copy of elements in the array list Insertion sort which case is only one comparison made for each position i: answer:The data are already in order What are number of additions and number of calls to find Fib(8) using recursive definition answer:33 and 67 Which of the following statements about Quick sort is true: answer:1.A strategy for selecting a bound is to choose the element located in th e middle of the array 2.Quick sort is recursive in nature Which of the following statements about elementary sorting is true answer:Advantage of using insertion ort that it sorts the array only when is rea lly necessary Select correct statements: answer:1.The middle part of the bit representation of the square of a key is ext racted using a mask and a shift operation 2.In practice, the mid-square method is more efficient to the size of table that is a power of 2 1- Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding 2. ... will visit nodes of a tree starting from the highest (or lowest) level an d moving down (or up) level by level and at a level, it visits nodes from left t o right(or from right to left). Answer: Breath-First Traversal Select correct statement. Answer: The keyword implements is used to specify that a class inherits from an interface. The operation for adding an entry to a stack is traditionally called: Answer: push 2. Which of the following keywords are access modifier: Answer: Protected, Private Select correct statements: Answer:- Subclasses or derived classes inherit the fields... , An abstract data type can be part of a program in the form of an interface. 4. Which of the following statements are true:  
  
Answer:- AN object can be saved in a life if its class type is stated, If the v ector s capacity is greater than its size, then a new elem 5. Which of sentences about singly linked list are true: Answer:- Deleting a node at the beginning of th ...time O(1) - On the average, delete operatio... O(n) steps, There is no immediate access to the predecessor of any node in list 6. Select correct statement(s) about Doubly Linked List: Answer: - The node which is deleted from the list will ... e garbage collection , Deleting a node at the end of...ant time O(1), Processing for adding a node to the end of list includes six steps 8. Select incorrect statement about skip list: Answer:- The search time is O(lgn) in the worst case , In 20-element skip lists , the node in position 3 points to the 9. Select false statement: Answer: - In the array list, poping is executed in O(lgn) to the worst case 10. Select true statements about stack: Answer: - The Java implementation of the stack is potenti, Stack can be impleme nted by linked list 11. Which of the following methods of queue are true: Answer: isEmpty() Check empty, enqueue(el) Put at the end of the, firstEl() urn the first without removing it 12. Which of the following can be executed in constant time O(n) Answer: - When deleting a node of a singly linked list in the average case , i n the worst case 13. Which of the following statements are true: Answer: - The recursive version increases program readability, improves self-do cumentation and simplifies coding 14. When converting a method from a recursive version into an iterative version Answer: The brevity of program formulation lost. However, the brevity may not be an issue in Java , Program clarity can be diminished 15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system. Answer: True 16. In all cases, nonrecursive implementation is faster recursive implementation . Answer: False 17. Which of the following concepts of tree are true: Answer: The height of a nonempty tree is the maximum level of node ,The level of a node is the length of the path from the root to the node plus 1,The level of a node must be between 1 and height of the tree 18. Select correct statement: Answer: For a binary tree with n nodes, there are n! different traversals, The c omplexity of searching depends on the shape of the tree and the,Breath-First tra versal Select incorrect statement Answer:Depth-first traversal can not be implemented if ,A recursive implementati on of preorder tree trav,There are six possible ordered depth-first trave 20. Which of the following statements are true: Answer:Polish notation eliminates all parentheses from formu, Using Polish notat ion, all expressions have to be brok,Expression trees do not use 21. Which of the following sentences are true: Answer: The complexity of DFS is O(|V| + |E|), where |V| is number of ve, To pre vent loop from happen in an algorithm for traversing a gra 22. Which of the following statements about finding the shortest path are true: Answer:For label-correcting method, information of any ,The complexity of Dijkst ra s algorithm is O(|V|2) ,The complexity of Ford s algorithm is O(|V||E|) fo 23. Which of the following statement about spanning tree is false: Answer: None of the others 24. Which of the following statements about graph coloring is true: Answer: The complexity of sequential Coloring algorithm is O(|V|2) ,Sequential C  
  
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oloring algorithm establishes the sequence of 25. Which of the following statements about efficient sorting is false: Answer:Shell sort divides the original array into physical subarrays, s 26. Which of the following statements about efficient sorting is false: Answer:The worst case is when the bound divides an array ,The best case of quick sort happens when bound is 27. Which of the following statements is true: Answer: All of the others: + All the sorting methods implemen In Insertion Sort, the number of movements and comparison for a randomly ordere d array is closer to the best case. Answer: False Which of the following statement about Open Addressing are false: Answer: In linear probing of the open addressing method, the position in which k ey,Using quadratic probing gives much better results than line 30. Which of the following statement are true: Answer: Linked list can be used in Bucket Addressing,Self-organizing linked list s can be used impro,Coalesced hashing combines linear probing 31. Which of the following statement about Perfect Hash Functions are true: Answer: Cichelli s method uses an exhaustive search ,Cichelli s method is used to ha sh relatively sma 32. Select correct statements: Answer: A reorganization of the file is avoided by using extendible hashing, The characteristic feature of extendible hashing is the organizatio 33. Which of the following data structure can be implemented Huffman Coding Answer: Singly linked list, Priority queue, Doubly linked list 34. Select incorrect statements about Huffman Coding: Answer: Huffman tree is only implemented by non-recursive. David Huffman s algorit hm may not be useful for se, Adaptive Huffman coding uses breath-first left-to-r ig 35. Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs 36. Identify whether below code has error or not: Abstract class AC1{ Answer: - Compile error 37. Identify whether below code has error or not: Interface I2{ Answer: - 3 compile errors ExtC object1 = new ExtC(); C object2 = new ExtC(), object3 = new ExtC(); Which of the following statements are true Answer: Object1.process2( N ) calls process2 of class Ext, Object2.process1(1) does not issue compile erro, Object2.process3( N ) call process3 of class C Data[j] = data[j-1]; Data[j] = tmp; } Identify which algorithm the above code implements Answer:- Insertion Sort If (data[j].compareTo(data[j-1])<0) Swap(data,j,j-1); } Identify which algorithm the above code implements Answer: - Bubble sort System.out.print(i+ Nontail(i+1); );  
  
} } What is output if nontail is called with i=3  
  
Answer: - Runtime error is issued. Nontail(i-2); } } What is output if nontail is called with i=5 Answer: 1315131 preorderVRL(p.left); } } What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: Answer: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: Answer: 2 6 8 3 15 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=5 of the outer for loop completed Answer: {2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=5 of the outer for lo Answer: - {19,18,14,6,5,10,15} Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: Answer:There may be runtime error in some case dentify whether the code of pop method has error or not: Answer: There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled. What output if reverse is executed and input string is ABCDEF\n Answer: - \nFEDCBA 51. Which of the following about queue are true Answer: A queue is an FIFO structure 52. Which of the following statement of queue are true Answer: All of the others: + Using array for queue implemen 53. Select false statement: Answer: In the array list, poping is executed in time O(n) to the worst case 54. In the doubly linked list implementation, enqueuing can be executed in time O(n) Answer: False 55. Which of the following statements about heap are false: Answer:Heaps represented by array can be travered easily in, A heap can be defin ed as an array heap of length n in, Heaps can be implemented by arrays 56. Consider below recursive define about tree: Answer: An empty structure is an empty tree 57. Which of the following statements about elementary sorting is true: Answer: None of the others + In selection sort, for every iteration j of,+ The w orst case of selection sort has n-1 58. Which of the following statements about efficient sorting is true: Answer: Insertion sort is applied to small portions of an array, Mergesort can b e made more efficient by replacing 59. Select correct statements about Radix sort: Answer: bitRadixsort() can be improved by implementing array , One of techniques radix sort uses is by looking at each 60. Which of the following statement is true: Answer: If hash function transforms different keys into different numbers, it is called a perfect hash function 61. Select correct statements: Answer: In shift folding method, the key is usually divided into even, The bound  
  
ary folding method is applied to number data 62. Which of the following statements are false: Answer: The best value of divisor can be any, The folding method is the preferre d choice for t Each codeword corresponds to one or more symbols Answer: False Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique Answer: True 65. Select correct statement about Ziv-Lempel Code Answer: All of the others: + Ziv-Lempel Code uses buffer + The codeword of Ziv-L empel The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol m; that is Answer: False 67. In the array implementation, enqueuing can be executed in constant time O(1) Answer: True 68. Which of the following about stack are true: Answer: The most top element is the latest added element , Operations of stack b ased on Last in First out structure. 69. In the array implementation, dequeuing can be executed in O(n) Answer: False 71. Select incorrect statement: Answer: The anchor or ground case allows for the construction of new objects out of basic e What is the value of h(1): Answer: 14 What is the value of A(3,1): Answer: 15 In all binary trees, there are 2i nodes at level i. Answer: False 75. Which of the following methods are used to traverse a tree without using any stack or threads: Answer: Traversal through tree Transformation 76. Which operation is used in DSW Algorithm: Answer: Rotation 77. Which of the following are false: Answer: A path from v1 to vn is a sequence of edges (v1v2), edges (v2v3) ,A circui t is a cycle in which all vertices must be different 78. Which graph representation is best? Answer: It depends on the problem 79. Which of the following statements about finding shortest path are true: Answer: For label-setting methods, in each pass through the vertices still, The methods solving the shortest path problem are divided into 80. Which of the following statements about graph coloring is true: Answer: Sequential coloring algorithm establishes the sequence of vertices, The complexity of sequential Coloring algorithm is O(|V|2) 81. Which of the following statement about finding the shortest path is false: Answer: - The complexity of WFI s algorithm is |V|3 that is good efficiency for a ny graph 82. In insertion sort algorithm, the number of times variables tmp is loaded and unloaded in the outer for loop is not: Answer: All of the others: + Necessary in the worst case + Redundant in the best case 83. Which of the following statements about Quick sort is true: Answer: Quick sort is recursive in nature A strategy for selecting a bound is to choose the element located in the middle of the array 84. Skip list helps avoiding sequential search  
  
Answer: True 85. Select correct statement(s): Answer:A singly linked list is a node that has a link only to its successor , serting a new node at the end of the singly linked list without ta 86. Which of the following operations are implemented in the LinkedList class longs to the java.util package: Answer: All of the others: + Return the copy of the linked list without + Add l the elements from one collection Let L1 (having n nodes) and L2 (having m nodes) be two linked list which are naged by the heads and tails. The complexity of direct concatenating L2 to L1  
  
In be al ma is  
  
Answer: O(1) 88. Which of the following operations are not implemented in the ArrayList class belongs to the java.util package: Answer: None of the others: + Remove the object at given position + Copy all obj ects from the array list to 89. Elements of a linked list must be consecutive memory cells Answer: False 90. If an algorithm is constantly accessing only some elements such as the first , the second, the last and the like, an if changing the structure is very import ant to the algorithm then solution is using: Answer: Linked list 91. The advantages of array over linked lists is that they allow random accessin g Answer: True 92. Which of the following operations are implemented in the ArrayList class bel ongs to the java.util package: Answer:All of the others: + Update one element in any+ Add one element to any po + Retrieve one element from 93. Linked lists allow easy insertion and deletion of information because such o perations have a Answer: True 94. In the doubly linked list implementation, dequeuing can be executed in const ant time O(1) Answer: True 95. Which of the following methods of queue are true: Put the element el at, Dequeue() Take the first element Answer: Enqueue(el) Consider the following recursive function, assuming n is even: What is the valu e of h(20): Answer: 11 97. Which of the following statements are false: Answer: An activation record still exists after a method, An activation record c ontains code of method 99. Most of the label-setting and label-correcting are used to find the shortest paths from one vertex to all other vertices Answer: False Which of the following statements about Perfect Hash Functions are true: Answer: In a minimal perfect hash function, wasting time for collision resolu, T he functioning in HCD algorithm is found in three steps: mapping, Hash function is function that can transform a particular key (K) (a string, nu mber or record) into an index the table used for storing items of the same type as K. Answer: True Entropy of source M is defined by: Answer: False Which of the following operations are not implemented in the ArrayList class bel ongs to the java.util package: Answer: Return the sub list of the array list containing copy of elements in the array list Insertion sort which case is only one comparison made for each position i:  
  
Answer: - The data are already in order What are number of additions and number of calls to find Fib(8) using recursive definition Answer: 33 and 67 Which of the following statements about Quick sort is true: Answer: A strategy for selecting a bound is to choose the element , Quick sort i s recursive in nature. 107. Which of the following statements about elementary sorting is true Answer: Advantage of using insertion ort that it sorts the array only when is re ally necessary Select correct statements: Answer: The middle part of the bit representation of the square of a key is, In practice, the mid-square method is more efficient to the size of \_class $value$ zer@ Angs\_trom Answer: zer@ Which statement concerning the switch construct is true? All switch statements must have a default label. A character literal can be used as a value for a case label The keyword continue can never occur within the body of a switch statement. All of the others. Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: new Integer(str)).intValue() Select correct statements about a singly linked list. Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list. All of the others None of the others. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list. A new node can be inserted into any position, except first position, without any traversal. Deleting a node at the beginning of a list involves setting head to point to hea d.next. All of the others. None of the others. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Properties of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once.  
  
In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong statements: Recursion is always more efficient than loops. Recursion can make the conceptual design of an algorithm s implementation easier. Recursion gone wrong can lead to overflow stack errors Recursion can be only replaced by iteration. Answer: is always more efficient than loops+ can be only replaced by iteration In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: Answer: Recursion Consider algorithm of the 8-queen problem: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: Right + Left rotation. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements: Djikstra's shortest path algorithm can be applied to undirected graph. The breadth-first search can be used to find the shortest path from a source ver tex to the destination vertex All of the others. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? Answer: Kruskal + Dijkstra algorithm. Which of the following statements about shortest path finding algorithms are tru  
  
e: Dijkstra s algorithm is label-setting algorithm. Dijkstra s algorithm can be applied to graphs have negative weights. The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertices of graph. All of the others. Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: Answer: All of the others. The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution: Answer: Open addressing. Which of the following hashing methods can cause collision: Answer: All of the others. Select incorrect statements: Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords.  
  
Answer: True Select incorrect statements about Data compression: a Huffman tree can be only constructed bottom-up. b In adaptive Huffman encoding, sibling property is retained assures the H uffman tree under construction is still a Huffman tree. c All of the others. d None of the others. Answer: Huffman tree can be only constructed bottom-up. Which expressions will evaluate to true if preceded by the following code? (a == "Hello") (a == b) (a == c) a.equals(b) Answer: (a == c)+a.equals(b) What is output when calling TriangularNumber(4) Answer: 10 What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10 Answer: 11 What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? Answer: 5 What is maximum number of elements in queue when traversing the below tree using the above algorithm? Answer: 4 Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop. Answer: {15,12,6,11,10,2,3,1,8} In the first loop, moveDown is called n/2 times in any case. The total number of moves in all executions of moveDown in the second phase is O (lgn). All of the others. None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. this is g of A this is g of C An error occurs when compiling the program. Nothing is printed. Answer: this is g of C Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. Answer: {3,4,8,10,12,17,5,14,13} How many times is number 840 printed out when call pattern(840) Answer: 2 How many integers will the program print when calling nonTail(n), n > 0. Answer: 2^n -1 Count number of even values in binary tree.  
  
Print even numbers in binary tree. Print even numbers in ascending order. Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Count number of nodes in binary tree. Calculate height of binary tree. Count number of nonterminal nodes in binary tree. None of the others Answer: Calculate height of binary tree. Check whether binary tree is balanced. Check whether height of left subtree is greater than height of right subtree. Check whether height of right subtree is greater than height of left subtree. None of the others. Answer: Check whether binary tree is balanced.  
  
Select incorrect statements about Object Oriented Programming: Static methods and variables are associated with the class it self and are called instance methods and instance variables The combination of data and related operations is called information hiding principle. Answer: Static methods and variables+ The combination of data Which of the following keywords are access modifier: Answer: protected + private Select correct statements: a. A derived class can override the definition of a final method by introducing its own definition t. In an abstract class, methods are only declared but not defined c. Subclasses or derived classes inherit the fields and methods from their base class. d. An abstract data type can be part of a program in the form of an interface Answer: Subclasses or derived classes inherit+ An abstract data type An object can be saved in a file if its class type is stated toimplement the Ser ializable interface, d. If the vector s capacity is greater than its size, then anew element can be inserted at the end of the vector immediately. Answer: An object + If the vector s capacity Which of sentences about singly linked list are true: Answer: begin O(1)+ average O(n)+ is no immediate a. Methods for processing doubly linked list are simpler than those of singly linked list b. The node which is deleted from the list will be claimed by the garbage collector. c Deleting a node at the end of the list takes constant time 0(1). d. Inserting a new node at the end of the list requires 0 ( n) steps. Answer: The node which is deleted+ Deleting a node at the end Select incorrect statement about skip list: Answer: None of the others. Select incorrect statement about skip list: The search time is O (ign) in the worst case.  
  
Answer: search time is O (ign)+20 element Select false statement: Stack can be implemented using linked list. Stack is applied to Java Virtual Machine, In the array list, poping is executed in O (lgn) to the worst case. In the array list, popping is executed in constant time 0(1) Answer: poping is executed in O (lgn) to the worst case. a. The Java implementation of the stack is potentially fatal. b. pop () method returns copy of the top element in the stack c. peek () method removes the top element of the stack and return it. d. Stack can be implemented by linked list. Answer: The Java implementation+ Stack can be implemented by linked list Which of the following can be executed in constant time 0 ( n) Answer: deleting singly linked list average case +worst case. Which of the following statements are true: Local variables must be stored in activation recordt. the return address is address of the caller s instruction immediately foil owing t he c al 1. Answer: all-in the most case When converting a method from a recursive version into an iterative version, Answer: The brevity not be lost + diminished Recursive definitions on most computers are eventually implemented using a run t ime stack and this implementation is done by the operating system. Answer: True In all cases, nonrecursive implementation is faster recursive implementation. Answer: False Which of the following concepts of tree are true: Answer: all -path is number of arcs Select correct statement: A search can takes 1g ( n) time units in the worst case. Answer: all-A search lg ( n)worst case.+ for a binary tree Select incorrect statement: Depth-first traversal can be implemented using stack. Depth-first traversal can not be implemented if not using stack A recursive implementation of preorder free traversal uses stack p1icitly. There are six possible ordered depth-first traversals. Morris s algorithm does not temporarily change free structure. Answer: all-DF stack+ morris Which of the following statements are true: a. Polish notation eliminates all parentheses from formulas b. Preorder, inorder and posorder tree traversal generate unambiguous outputs. Using Polish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order d. In a expression tree, leaves are operators and nonterninal nodes are operands.  
  
e. Expression trees do not use parentheses. f. Polish notation is only applied for compilers. Answer: parentheses +Using Polish+ Expression Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithmis O(VWEh for any graph. t. For label-correcting method, information of any label can be changed during application of method. c. Ford s algorithm relies on label -setting method. t The complexity of Dijkstra s algorithm using heap is O(VlnV) e. The complexity of Dijkstra s algorithm is o( v12) Answer: complexity Dijkstra s +complexity Dijkstra s + label-correcting Which of the following statement about spanning tree is false: a. The complexity of Kruskal s algorithm depends on the complexity of the sorting method applied t. The complexity of Kruskal s algorithm depends on the method used for cycle detection. c. All of the others. t None of the others. Answer: None of the others. Which of the following statements about efficient sorting is false: a. The worst case is when the bound divides an array into subarrays of approximately length b. In quick sort, a strategy for selecting a bound is to choose the element located in the middle of the array. c The best case of quick sort happens when bound is the largest (the smallest) element of the array. d. Quick sort is recursive in nature. Answer: n/2 + best case Which of the following statements is true; a. All the sorting methods implemented in java is applied to any basic data type. t. For objects comparison, a comparison criterion must be implemented by user for all classes. c All of others. t None of others. Answer: All of others. In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. Answer: false Which of the following statement are true: Linked list can be used in Bucket Addressing. In chaining, searches always fast if using linked lists. Answer: All-in chaining correct statements a. Extendible hashing is directoryless technique t. Extendible hashing is faster than and requires less space than Linear hashing. c. A reorganization of the file is avoided by using extendible hashing if the directory overflows. The characteristic feature of extendible hashing is the  
  
organization of the index, which is expandable table. e. Linear hashing is directory technique. Answer: reorganization + characteristic incorrect statements about Huffman Coding Answer: all-Huffman tree can be built top-down. correct statements about Run-length encoding. Answer: A serious drawback of run-length encoding is that it reliesentirely on the occurrences of runs Identify whether below code has error or not: Answer: Compile error. Identify whether below code has error or not: Answer: 3 Compile error. objectiprocess2 ( N ) calls process2 of class ExtC. object2.processl (1) does not issue compile error. object2.process3 ( N ) call process3 of class C. object3.process2( N ) call process2 of class C. Answer: all-object3.process2( N ) call process2 of class C. Identify which alogrithm the above code implements Insertion Sort Bubble Sort Selection Sort Radix Sort Answer: Insertion Sort Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is ABCDEF\n Answer: FEDCBA What is output if nontail is called with j = 3 Runtime error is issued 1213121 12321 21312 Answer: Runtime error is issued What is output if nontail is called with i = 5 1315131 13531 3135313 None of the others Answer: 1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: 1211181021563 28 112 11106153 2631581011112 12 1111082 1536 Answer: 2631581011112 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image:  
  
1211181021563 28 112 11106153 263 15 81011112 121111082 1536 Answer: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 2863 15 10112 11 286110153 12 11 268 110 153 1112 2683 15 10 11112 Answer: 2683 15 10 11112 Assume that sort is executed with array {9,4,2,5,8,15,3}. What is output after iteration i=5 of the outer for loop completed Answer: {2,4,5,8,9,10,3) Assume that sort is executed with array {19,14,6,5,18,1,15}. What is output afte r iteration i=5 of the outer for loop completed Answer: { 19, 18, 14,6,5,10, 15) Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: There are some compile errors. There may be runtime error in some case. There always are runtime errors. No error. Answer: There may be runtime error in some case. Identify whether the code of pop method has error or not: Answer: There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string Â¡s ABCDEF\n t Answer: \nFEDCBA Skip list helps avoiding sequential search answer: true A tree structure is not linked structure answer: a singly lnked list + inserting a new model Which of the following operations are implemented in the linkedlist class belong s to the java.util package answer: all of the others Which of the following operations are implemented in the Arraylist class belongs to the java.util package answer: none of the others Let L1 (having n nodes) and L2 (having m nodes) be two linked lists which are ma naged by the heads and tails answer: o(1) In the array implementation, enqueuing can be executed in constant time o(1) answer: true Select true statement about stack: answer: The Java implementation of the stack+ stack can be implemented by linked list Which of the following about stack are true answer: the most top element + Operations of stack based In the array implementation, dequeuing can be executed in o(n)  
  
answer: false Which of the following about queue are true: answer: A queue is an FIFO structure In the doubly linked list implementation, dequeuing ca be excuted in constant ti me o(1) answer: true In the doubly linked list implementation, enqueuing ca be excuted in o(n) answer: false Which of the following methods of queue are true answer: enqueue + dequeue(first) + isempty + firstel Select true statements about stack answer: Stack can be implemented by linked list + the java implementation of the stack is potentially fatal Which of the following statement about queue are true answer: all of the other Select false statement answer: in the array list, poping is excuted in time o(n)to the worst case Select correct statement about Doubly Linked List answer: Deleting a node at the end of the list takes constant time o(1)+ process ing for adding a node The advantage of arrays over linked lists is that they allow random accessing answer: true Inserting a new node at the end of the singly linked list answer: a singly linked list is a node + A linked list is a collection of nodes Which of the following operations are not implemented in the Arraylist class bel ongs to the java.util package answer: return the sub list of the array list Which of sentences about singly linked list are true: answer: There is no immediate access to the predecesor+ on the average+ deleting a node at the beginning of the list Select incorrect statements about object- oriented programming: answer: the combination of the data+ satic methods and variables x=7; y=4\*++x; z=5\*x--; what the values of x,y,z answer: x=7, y= 32, z= 40 characters are 16 bits long answer: characters are 16 bits long+ for a postfix+ Character that constitute va riable Seclect false statement about Java: answer: Java is not case sensitive Which of the follwing statements are invalid answer: int c= {1,2,3,4,5}int []b= int[4]int e[5] Java allows multi inheritance answer: if the vector's capacity is greater than its size + a vector is a data s tructure Dynamic binding determines the type of response at compilation time answer: polymorphism is implemented through static + the data structures field i s designed A condition in if clause can be any value answer: A condition in if clause can be any value + for a prefix operator + the program continuws with a statement In an abstract class, method answer:In an abstract class, method+subclasses or derived classes+an abstract da ta type Java uses four access modifiers answer: a package is a collection of classes + Java uses four access modifiers When converting a method from a recursive version into an iterative version answer: the brevity of program formulation lost+ program clarity can be diminish ed Consider the following recursive function, asuming n is even answer: 11  
  
Recursive definitions serve generating new elements and testing whether an eleme nt belongs to a set answer: the anchor or ground case allows for the construction of new object In all cases, nonrecursive implementation is faster recursive implementation answer: false The data area containing state information of one method is called an activation record answer: an activation record still exists + an activation record contains code o f method What is the value of h(1) answer: 14 What is the value of A(3,1) answer: 13 What are number of additions and number of calls to find Fib(8) answer: 34 and 67 Recursive definitions on most computers are eventually implemented using a run-t ime stack answer: true Global variables must be stored in activation record answer: the recursive version increases program readability+ the return address is address Consider below recursive define about tree answer: true Which of the following methods are used for Depth-First Traversal answer: all of the other Expreesion trees do not use parenthese answer: Polish notation eliminates all parenthese from formulas+ Using polish no tation, all expressions have to be...+ Expression trees do not use parenthese In all binary trees, there are 2 nodes at level i answer: false Which of the following concepts of tree are true answer: The height of a nonempty tree is the maximum+ the level of is the length of the path from+ the level of node There are six possible ordered depth-first traversals answer: Morris's algotrthm does not temporarily change tree structure+ a recursi ve implementation + depth first traversal can not be Which of the following statements about heap are false answer: heap represented by array+ a heap can be defineed as an array+ heaps can be implemented by array Which of the following methods are used to traverse a tree without using any sta ck or threads answer: traversal through tree transformation Which operation is used in DSW algorithm answer: rotation A pseudograph is multigraph which allows for loops to occur answer: a path from v1 to vn + a circuit is a cycle Which graph representation is best answer: it depends on the problem Which of the following statements about finding the shortest path are true answer: For label-setting methods, in each pass through+ the methods solving the shortest path problem are Which of the following statements about graph coloring is true answer: sequential coloring algorithm + the comlexity of sequential Which of the following statements about finding shortest path is false answer: the complexity of WFI's algorithm is V3 The chromatic number of the cycle answer: the choromatic number of the complete+ in Brelaz's algorithm Most of the label-setting and label- correcting methods are used to find the sho rtest paths from one vertex answer: true  
  
Which of the following statements about elementary sorting is true answer: none of the other Which of the following statements about efficient sorting is true answer: Insertion sort is applied+ Mergesort can be made more In insertion sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case answer: false Which of the following statements about efficent sorting is true answer: all of the other Select correct statements about Radix sort answer: bitradixsort() can be improved + One of techniques radix sort In insertion sort algorithm, the number of times variable tmp answer: all of the other Which of the following statements about quick sort is true answer: quick sort is recursive in nature + a strategy for selecting a bound is to choose Mergesort don't consume much memory answer: Mergesort can be made more efficient + Insertion sort is applied to smal l portions To create a hash function, the table has to contain at least the same number of positions answer: if hash function transforms different keys into different numbers Which of the following statements about open addressing are false answer: using quadratic probing gives much better results than linear probing an d avoids the problem+ in linear probing of the open Linear hashing is directory technique answer: the characteristic feature of extendiable+ a reorganization of the file Linked list can be used in bucket addressing answer: coalesced hashing combines linear probing with chaning+ linked list can be used The mid-square method is applied only to number data answer: the middle part of the bit representation of the square of a key + in pr actice, the mid-square The shift folding method is applied to string data answer: in shift folding method+ the boundary folding method The best value of divisor can be any answer: The best value of divisor can be any+ the folding method is the preferre d choice Which of the following statements about perfect hash functions are true answer: in a minimal perfect hash function+ the function g in FHCD Hash function is function that can transform a particular key answer: true Each codeword corresponds to one or more symbols answer: false Run- lenght encoding is very efficient for text file in which only blank charact er answer: true Select correct statement about Ziv-Lempel code answer: all of the others Select correct statement about run-length encoding answer: A serious drawback of run length encoding The length of the codeword for a given symbol mj shoukd not less than the length answer: false Select incorrect statements about huffman coding answer: huffman tree is only implemented+ adaptive huffman coding uses breath-fi rst 1. Select incorrect statements about Object - Oriented Programming answer: [static methods and variables are...][The combination of data and...] 2. Which of the following keywords are access modifier: answer: [protected][private]  
  
3. Select correct statements answer: [Subclasses or derived classes inherit...][An abstract data type can be part of a...] 4. Which of following statements are true answer: [an object can be saved in a file if..][If the vector's capacity is grea ter than its size,..] 5. Which of sentences about singly linked list are true: answer: [Deleting a node at the beginning...O(1)][On the average,...O(n)step][th ere is no immediate..] 6. Select correct statement(s) about Doubly Linked List answer: [The node which is deleted...garbage collector][Deleting a node at the e nd...O(1)] 7. Select incorrect statement about skip list answer: None 8. Select incorrect statement about skip list answer: [The search time is O(lgn)...worst case][In 20-element skip list...3poin ts...position 7] 9. Select false statement answer: In the array list, poping is executed in O(lgn) to the worst case 10. Select true statements about stack answer: [The Java implementation .... fatal][Stack can be implemented by linked list] 11. Which of the following methods of queue are true answer: [isEmpty() - Check to see...][enqueue(el)-put the element..][firstEl() Return the first..] 12. Which of the following can be executed in constant time O (n) answer: [when deleting a node...average case][when deleting a node...worst case] 13. Which of the following statements are true answer: [Local variables...activation record][The return address...following the call][The recursive ver...] 14. When converting a method from a recursive version into an iterative version answer: [The brevity of program formulation lost... may not be.. Java][Program c larity can be diminished] 15. Recursive definitions on most computers are eventually implemented using a r un-time stack and this implementation is done by the operating system. answer: true 16. In all cases, nonrecursive implementation is faster recursive implementation answer: false 17. Which of the following concepts of tree are true answer: [The height of nonempty tree is the max...][The level of a node is the l ength ...root..node plus 1][The level of a node must be ...1 and height..] 18. Select correct statement answer:[The complexity of searching a node...][The complexity of searching depen ds...][Breath-First ...using queue] 19. Select incorrect statement answer: [Depth-first traversal can not be ... if not using track][A recursive im plementation preorder...uses stack...][There are six possible ordered...] 20. Which of the following statements are true answer: [Polish notation eliminates all ...][Using Polish notation,...broken dow n....proper oder][Expresstion trees do not use pare...] 21. Which of the following sentences are true answer: [The complexity of DFS is O(|V|+|E|)...][To prevent loop from happen in an ... can be marked] 22. Which of the following statements about finding the shortest path are true anwer: [For label-correcting method, ....][The complexity of Dijkstra's....is O( |V|ln|V|)][The complexity of Dijkstra's....is O(|V|^2)] 23. Which of the following statement about spanning tree is false answer: None 24. Which of the following statements about graph coloring is true answer: [The complexity of sequential .... O(|V|^2)][Sequential Coloring establi  
  
shes ....before coloring them] 25. Which of the following statements about efficient sorting is false answer: [Shell sort divides the original array into physical .... array is sorte d][Only inscrtion sort is appllied ...] 26. Which of the following statements about efficient sorting is false answer: [The worst case is when the bound divides... length n/2][The best case o f quick sort happens... element of the array] 27. Which of the statement is true answer: [All the sorting methods implemented...basic data type][For objects comp arison...by user for all classes] 28. In Insertion Sort, the number of movements and comparisions for a randomly o rdered array is closer to the best case answer: false 29. Which of the following statement about Open Addressing are false answer: [For quadratic probing, the size of table should not be ...][Using quadr atic probing gives much better....linear and avoids ... cluster buildup] 30. Which of the following statement are true answer: [Linked list can be used in Bucket Addressing][Self-organizing linked li st ...improve performance in chaining][Coalesced hasing combines linear probing with chaning] 31. Which of the following statement about Perfect Hash are true answer: [Cichelli's method uses an exhaustive search][Cichelli's method is used to hash relatively small number...] 32. Select correct statements answer: [A reorganization of the file is avoided ... overflows][The characterist ic feature of extendible hashing... expandable table] 33. Which of the following data structure can be implement Huffman Coding answer: [Singly linked list][Priority queue][Doubly linked list] 34. Select incorrect statements about Huffman Coding answer: [Huffman tree is only imp.... non-recursive..][David Huffman's ...may no t be useful for sending..][Adaptive Huffman coding uses breath-first left-to-rig ht... counter] 35. Select correct statement about Run-length encoding answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs 36. Identify whether below code has error or not answer: abstract class AC1{ int AC1f1() {return 0;}void AC1f2(int i) {return ;} int AC1f3();} ==> compile error 37. Identify whether below code has error or not answer: interface I2{ double I2f1(); void I2f2(int i); void I2f1(); double I2f3( ){return 10;}; int n =10; pri double m;} ==>3 compile errors 38. Which of the following statements are true answer: [object1.process2('N') calls process2 of class ExtC][object2.process1(1) does not issue compile error][object2.process3('N') call process 3 of class C] 39. Identify which alogrithm the above code implements answer: for(int i = first, j; i<=last; i++){int tmp = data[i]; for(j=i; j>0 && t mp Insertion Sort 40. Identify which alogrithm the above code implements answer: pulic extends Com........{ for(int i=0;ii;--j) if(data[j].compareTo(data[j-1]) < 0) swap(data,j,j-1 );} ==> Bubble sort 41. Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is "ABCDEF\n" answer: public.... reverse(){char ch = getChar(); if(ch != '\n'){ reverse(); sou t(ch);}} ==>FEDCBA 42. What is output if nontail is called with i = 3 answer: void nontail(int i){if(i>0){nontail(i+1); sout(i+""); nontail(i+1);} ==> Runtime error 43. What is output if nontail is called with i = 5 answer: void nontail(int i){if(i>0){nontail(i-2); sout(i+""); nontail(i-2);} ==>  
  
1315131 44. What is output if preorderVRL is executed and structure of Binary Tree is th e following image answer: 2 6 3 15 8 10 1 11 12 (lay ben phai roi lay ben trai) 45. What is output if breadthFirst is executed and structure of Binary Tree is t he following image answer: 2 6 8 3 15 10 1 11 12 (Tu tren xuong duoi, tu phai qua trai) 46. Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output aft er iteration i=5 of the outer for loop completed answer: {2,4,5,8,9,10,3} 47. Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output after iteration i=5 of the outer for loop completed answer: {19,18,14,10,6,5,15} or //{19,18,14,6,5,10,15}// 48. Let deleteFromHead be method used to delete the first element of generic sin gly linked list class. Identify whether above code has error or not answer: public T dele...(){T el = head.info; if(head==tail) head = tail=null; el se head=head.next; return el;} ==> There may be runtime error in some case 49. Identify whether the code of pop method has error or not answer: public class Stack{ pri java.util.Array.... pool = new java.ut.....; ... public T pop(){return pool.remove(pool.size()-1); ==> may be runtime error i n some case 50. Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is "ABCDEF\n" answer: public.... reverse(){char ch = getChar(); if(ch != '\n') reverse(); sout (ch);} (sout ngoai if) ==> \nFEDCBA 1. Consider the following soft algorithm answer: public extends...... void insertionsort....{for(int i=1,j;i descending order 2. Which of the following strategies fit to binary Search trees that only have s ome elements constantly accessed? answer: [Use the DSW][Use Self-Restructuring][Use the AVL] 3. What is output after executing unknown(s,0,12), where s = "1352467642135"? answer: Stack overflow error 4. What is the worst-case time for finding an element in a Binary tree? answer: O(n^2} 5. Which of the following problems may use the recursion technique answer: detect a cycle in a graph 6. Identify which alogrithm the above code implements answer: moveDown(data,0,i-1) ==> bubble sort 7. When a method call is executed, which information does it activation record c ontain? answer: None 8. Which of the following algorithms in graphs can be implemented by extending D epth First Search algorithm answer: All of the others 9. Which of the following problems may use stacks implicitly or explicitly answer: All 10. Which of the following statements are true answer: [The complexity of Breadth First.... is O(|V|+|E|)][The Depth First Sear ch for graph traversal.... nectivity and undirected] 11. Suppose temp refers to the third node in the doubly linked list that has mor e than 5 nodes. What statament changes temp so that it refers to the first node answer: temp = temp.previous.next.next.previous 12. A queue is implemented using a doubly linked list, which of the following op erations require O(n) time? answer: clear(remove all elements from the queue) 13. Which traversal method is used in Adaptive Huffman tree? answer: Breadth First traversal  
  
15. What is the complexity of inserting a node in a perfectly balanced tree for worst case? answer: O(lgn) 16. This method is used to answer: {.... return s.subtring(0,1)+unknown(s,substring(1),ch);}return "";} ==> removes the first occurrence of the specified character from the string ... 17. In the array implementation of the queue, which operations require constant time? answer: isEmpty 18. Which of the following statements about the Stack are true answer: [Clear operation in the linked list .... constant time O(1)][Popping ope ration in the linked list ....constant time O(1)] 19. Suppose that obj is an Object variable and that it refers to an Integer obje ct. If s is a String variable, then which statement is correct about the assignm ent "s=(String) obj;"? answer: The statement will compile, but there will be a run-time exception 20. A chained hash table has an array size of 1024. What is the maximum number o f entries that can be placed in the table answer: There is no maximum 21. Which of the following definitions about a collision in a hash table are inc orrect answer: Two entries with different data have the exact same key 22. Which of the following statements about Run-Length encoding are false answer: run-length encoding cannot be applied to compress fax images 23. A recursive method may be eliminated by using answer: [Iteration statements][Stacks] 24. "What is number of comparisons in the worst case for mergesort to sort an ar ray of n elements?" answer: O(n^2) 25. Which of these operations are likely to have a constant time for worst-case in the singly linked lists? answer: None 26. Which of the following Sorting algorithms have complexity of O(n) in best ca se answer: All 27. Which of the following Sorting algorithms use Divide and Conquer strategy answer: Quick sort 28. What is the number of comparisons and swaps in the best case for creating a heap using top down method (William's method) answer: The number of comparisons is 2.[n/2] and swaps is zero 29. Which of the following statements about Merge sort method are incorrect answer: Merge sort can be made more efficient by replacing recursion with iterat ion 30. Which of the statements about Ziv-Lampel Code are false answer: None 31. Select incorrect statement about skip list answer: [Insertion and Deletion are very inefficient][The search time is O(lgn) in the worst case 32. Select correct statement about Ziv-Lemepel Code answer: [uses buffer of symbols][The codeword of Ziv-Lemepel Code is a triple] 33. Algorithms are applied to graphs answer: [Depth First Search][Breadth first Search] 34. Suppose temp refers to some node in a doubly linked list. What boolean expre ssion can be used to check whether temp refers to the first node of the list answer: temp.previous.next.previous == null 35. Suppose that obj is an Object variable and that it refers to an Integer obje ct. If s is a String variable, then which statement is correct about the assignm ent "s = (String) obj;"? answer: The statement will compile and run with no exception  
  
36. When a method call is executed, which information is not saved in the activa tion record answer: Location where the method should return when done What is written to the screen for the input "HowAre\*\*\*You\*\*To\*\*\*Day"? answer: HowAreYou Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex F. What are the correct order of vertices selected into the set S until the vertex F is selected? answer: A,C,D,F Consider the binary tree below. Which statement is correct? answer: The tree is neither complete nor full 7 5 6 4 3 9 8 2 answer: 7 5 6 4 3 9 8 2 1 Consider the AVL tree below. What is the breadth first traversal of the tree aft er inserting a node with value 22? answer: 35,20,45,10,25,40,22,30 Suppose we are considering a singly linked list and p is some node in the list w hich has successor node. Select the most correct java code snippet that deletes the successor node of p(the node after p). anser: Node q =p.next; p.next=q.next. Suppose a doubly linked list of integers is given below and tail is a reference to the last node in the list: (head) 7 1 6 4 3 9 8 2 (tail) answer: 7 1 6 4 3 9 8 5 2 Specify the correct implementation of dequeue() menthod of a queue. This queue u ses java.uti.LinkedList for storing data and the head of the list is treated as the head of the queue. answer: Object dequeue() {if(isEmpty()) return(null);return(pool.removeFirst()) ;} void fun(int n) { if(n < 0) { System.out.println("-"); fun(-n); } else if( n<15 )System.out.println } answer: n >= 15 7, 5, 11, 12, 3, 10, 2, 4, 8, 6 answer: 2,3,11,12,5,10,7,4,8,6 Specify the correct statement about hashing algorithm? answer: If the coalesced method is used for collision resolution, insertion and searching(and sometimes deletion)always take constanttime:0(1) B: 32% C: 28% D: 16% E: 6% F: 18% answer: 001 Suppose a G is given below(view picture). Which of the followings is the Hamilto n cycle from the vertex B, created by above algorithm? answer: B A F D E C B What is the value of the Boundary Folding Hash Function if K = 42-65-76-7 and TS ize = 100? answer: 82 Suppose we are considering a binary search tree. Select the most correct java co de snippet that search a node with value x. answer: Node search(int x){Node p = root; While(p!=null && p.info!=x) if(x>p.inf o)p=p.left; else p=p.right;} Select the statement that is the most correct. answer: For a recursive method to terminate there must be on or more limit condi  
  
tions Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex B. what is the label of the vert ex D when the shortest path from A to B is determined? answer: 17 Select the most correct statement about the complexity of insertion sort answer: the best case is O(n), and the worst case is O(n2) consider the AVL tree below. What is the breadth first traversal of the tree aft er inserting a node with value 28 answer: 35 20 45 10 28 40 25 30 The operation for adding an entry to a queue is traditionally called: answer: enqueue 1 0 1 answer: int n,k; n=13 4 9 9 answer: int a,b; void set(int a1, int b1) What is the breadth-first traversal of a tree below after deleting the node 5 by merging? answer: 4 2 7 1 3 6 8 What is the value of the Shift Folding Hash Function if the key K =44-65-76-8 an d TSize=100 answer: 90 In a real computer, what will happen if you make a recursive call without making the problem smaller? answer: the results are nondeterministic To implement an AVL tree, aconcept balance factor is introduced(bal = height(rig ht)-hight(left)).Suppose an AVL tree is created by inserting to the tree the fol owing keys sequentially: 6, 4, 7, 3 ,5 ,2 What is the balance factor of the node 4 answer: -' 16, 5, 2, 11, 10, 8, 12, 3, 8, 6 answer: 2 5 16 11 10 8 12 3 8 6 Consider the AVL tree below. What is the preorder traversal of the tree af ter d eleting the node with value 40? answer: 12 22 27 32 35 45 Which of the following methods is used to collision resolution: answer: Cicheli's method The operation of visiting each element in the list exactly once is know as answer: Traverse Specify the correct statement about the fun() method in the code above answer: It removes the first element of the list 6, 4, 9, 10, 8, 3, 7, 5 answer: 3 4 5 6 8 7 9 10 Suppose the f(n) function is defined on the set of integer numbers as below. Wha t is the valuse of f(-5)? answer: 3 State True or False:"In a binary search tree, all the nodes that are left descen dants of the node A have key values greater than A; all the node that are A's ri ght descendants have key values less than (or equal to)A." answer: False Suppose we are considering a singly linked list which has at least 2 nodes. Sele ct the most correct java code snippet that inserts new node with value x before the last node answer: dek biet Given a graph below. What is the output of depth-first traversal from vertex B?( visit nodes in ABc order if there are some nodes having the same selection abili ty) answer: B A E G C F D Given araw message 'BBBUUUUBBBUUBBBBBUU' answer: 3B4U4B3U2B5UU2  
  
What is maximum nuber of activation records( including its caller ) in runtime s tack when calling TriangularNumber(10) answer: 9 Node q = p.next; p.next = q.next; answer: It deletes the node after p Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex B to the vertex F. What are the correct order of vertices selected into the set S until the vertex F is selected? answer: B C D F The complexity of heap sort is answer: 2 fun(-1012) answer: int fun(int n) 6, 4, 9, 10, 2, 8, 1, 3, 7, 5 answer: 4 6 9 2 8 1 3 7 5 10 Integer "j" is not initialized answer: for(int i=0;i<14;i++) 5 100 100 answer: (A h = new A(5)) B: 32% C: 28% D: 16% E: 6% F: 18% Using Huffman encoding, what is the code for character D? answer: 0' Given a weighted graph below and you are using the Dijkstra algorithm to find th e shortest path from the vertex A to the vertex F. what is the label of the vert ex E when the shortest path from A to F is determined? answer: infinity Node p1,p2;p1 = p.prev;// prev is a link to previous node answer: It deletes the node p Select the statement that is most correct. Which of the following applications m ay use a stack answer: store a waiting list of printing jobs Specify the most correct statement about chaining method for handing collision answer: in chaining, some positions of the table is associated with a linked lis t or chain of ... n>=0&&n<15 answer: void fun(int n) what is output when calling Triangularnumber(4) answer: 10 Suppose a graph G is given by the adjacency matrix below. Which of the following s is the Hamilton cycle answer: A D E C B A Select incorrect statement about Data compression answer: Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance Specify the statement that is most correct about a circular linked list answer: Cicurlar linked list is a linked list in which the last node of the list points to the first node in the list What is written to the screen for the input"Good\*\*Morn\*\*in\*\*\*g"? answer: GoMg Specify the correct statement about open addressing method for handling collisio n answer: The collision is resloved by finding an available table entry orther tha t the position to which the colliding key is originally hashed Assume in direted graph edge uv means "vertex v depends on vertex u".What is val id topological sort the graph shown below:  
  
answer: A B D C E F G H Given a graph below. What is the output of breadth-fist traversal from vertex C ? answer: C B D A E F G 6, 7, 3, 1, 2, 5, 8 answer: 6 3 7 1 5 8 2 8, 5, 11, 12, 3, 10, 2, 4, 9, 6 answer: 2 3 11 12 5 10 8 4 9 6 Fill in blank to form a correct statement: " A recursive method is a method that invokes itself directly or indirectly. For a recursive method to terminate ther e must be one or more \_\_\_\_\_\_\_\_\_\_\_". answer: Limit conditions What is the breadth-first traversal of a tree below after deleting the node 5 by copying? answer: 4 2 7 1 3 6 8 Suppose a multigraph G is given by the adjacency matrix below. Which of the fool owings is the Euler cycle? answer: A B C B D A Select incorect statement about Object - Oriented Programming answer: Static methods and avariables are associated Which of the following keywords are access modifier answer: protected , private Select correct satements answer: In an abstract class , subclasses or derived classes , An abstract data type Which following statements are true answer: [2] An object can be saved , If the vector's Which the sentences about singly linked list are true answer: [3] Deleting a node ; On the average ; There is no immediate Select correct statement(s) about Doubly Linked list answer: [2] the node which ; Deleting a node Select incorrect statement about skip list answer: None of others Select incorrect statement about skip list answer: The search time is 0(lgn) Select false statement answer: In the array list, poping is executed in 0(lgn) Select true statements about stack answer: The java ; Stack can be implemented Which of the following methods of queue are true answer: isEmpty(); enqueue(el); firstEL() Which of the following can be executed in constant time O( n ) answer: When deleting a node , when deleting a node Which of the folowing statements are true answer: The return address; The recursive version When converting a method from a recursive version into an iterative version answer: The brevity of program formulaion; Program clarity Recursive definition on most computers are eventually implemented using a run-ti me stack and this implementation is done by the operating system answer: true In all cases, nonrecursive implementation is faster recursive implementation answer: true Which of the following concepts of the tree are true answer: the height ; the level ; the lever Select correct statement answer: The complrxity of searching depends on the shape of the tree and the pos ition of the node in the tree ; Breath-First; For a binary tree Select incorect statement answer: Depth-first traversal can not be implemented if not using stack ; A recu rsive ; Morri's algorithm  
  
Which of the following statement are true answer: Polish notaion ; Using polish notation; Expression trees Which of the following sentences are true answer: the complexity of DFS is O(|V|+|E|); To prevent loop Which of the statements about fiding the shortest path are true answer: For label ; Ford's ; the complexity of Dijkstra's algorithm is O(|v|2) Which of the sollowing statement about spanning tree is false answer: none of other Which of the following statements about graph coloring is true answer: In sequential coloring algorithm vertices must be ordered according to i ndices already to the vertices ; The complexity ; Sequential Which of the following statements about efficient sorting is false answer: Shell sort divides the original array into physical ; Only insertion Which of the following statements about efficient sorting is false answer: The worst case; The best case Which of the following statement is true answer: for obiject comparison In Insertion Sort, the number of moovements and comparisons for a radomly ardere d array is closer to the besr case answer: False Which of the following statement about Open Addressing are false answer: Using quadratic probing ; Which key can be stored Which of the following statement are true answer: Linked list ; Self-organizing; Coalesced Which of the following statement about Perfect Hash Function are true answer: Cichelli's method uses an exhaustive search ; Cichelli's method is used to hash relatively Select correct statements answer: A reorganization ; The characteristic Which of the following data structure can be implement Huffman Coding answer: Sigly linked list ; Priority queue ; Doubly linked list Select incorrect statements about Huffman Coding answer: Huffman tree is only implemented ; Adaptive Huffman coding Select correct statement about Run-lenght encoding answer: A serious drawback of run-length encoding Indentify whether below code has error or not answer: Compile error Assume the getChar() only reads one character of the input string every it is ca lled. What is output if reverse is executed and input string is "ABCDEF\n" answer: FEDCBA What is output if nontail is called with i = 3 answer: runtime error is issued What is output if nontail is called with i = 5 answer: 1315131 what is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image answer: 2 6 3 15 8 10 1 11 12 what is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image answer: 2 6 8 3 15 10 1 11 12 {19,14,6,5,18,10,15} answer: {19,18,14,6,5,10,15} {9,4,2,5,8,10,3} answer: {2,4,5,8,9,10,3} Identify whether above code has error or not answer: There may be runtime error in some case Identify whether the code of opo method has error or not answer: There may be runtime error in some case Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is"ABCDEF\n"  
  
answer: \nFEDCBA Which statements are true about inheritance? a In Java the extends clause is used to specify inheritance b A subclass must define all the methods from the superclass. c A class can extend any number of other classes. d All of the others. Answer: In Java the extends clause is used to specify inheritance Which statements are true about interfaces? a The keyword implements is used to specify that a class inherits from an interface. b Members of an interface can always be declared static. c Interfaces can extend any number of other interfaces. d None of the others. Answer: Interfaces can extend any number of other interfaces. Which one of these for statements is valid a for (int i=10; i=0; i--) {} b for (int i=0, j=100; i0); i--) {} Answer: for (int i=0, j=100; i  
   
c d  
  
p.next == q.next None of the others.  
  
Answer: p.info == q.info Which of these operations are likely to have a constant time for worst-case in t he linked lists? a addBefore (add a new element into before an element in the list). b countOccurrences (count number of an element s present times in the list). c Delete (remove an element in the list). d None of the others. Answer: None of the others. The operation for adding an entry to a stack is traditionally called: a add b append c insert d push Answer: push In the array version of the Queue, which operations require O(n) time for their worst-case behavior? a dequeue b insert when the capacity has not yet been reached c isEmpty d None of the others Answer: None of the others Which of the following applications may use a stack? a A parentheses balancing program. b Keeping track of local variables at run time. c Syntax analyzer for a compiler. d All of the others. Answer: All of the others. In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? a dequeue b insert c isEmpty d None of the others Answer: None of the others When a method call is executed, which information is not saved in the activation record? a Local variables b Location where the method should return when done. c Current depth of recursion. d Values for all parameters to the method. Answer: Current depth of recursion. When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? a Primitive values are all treated as reference variables  
  
b c d  
  
Reference variables are all treated as primitive values There is no duplication of local variables None of the others.  
  
Answer: None of the others. Select correct statements about recursion Any iterative program can be written recursively. Every recursive method can be converted into an iterative version. Quicksort and mergesort are recursive in nature. All of the others. Answer: All of the others. Select a b c d the one TRUE statement. Every binary tree is either balanced or perfect balanced. Every balanced binary tree is also a perfect balanced binary tree. Every perfect balanced binary tree is also a balanced binary tree. No binary tree is both balanced and perfect balanced.  
  
Answer: Every perfect balanced binary tree is also a balanced binary tree.  
  
is visiting node starting from the highest (or lowest) level and moving down (or up el by level, visiting nodes on each level from left to right (or from right to l eft). a Breath-First Traversal b Depth-First Traversal c Stackless Depth-First Traversal d None of the others Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. a The DSW Algorithm b One classical method has been proposed by Adel son Vel skii and Landis (AVL tree). c All of the others d None of the others Answer: The DSW Algorithm A heap is an exellent way to implement a a stack b queue c priority queue d tree. Answer: priority queue What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). a O(m) b O(n) c O(m2) d O(n2) ..  
  
Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? a Breadth-first search. b Depth-first search. Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? a Breadth first search. b Depth first search. c A cycle-finding algorithm. d A shortest-path algorithm. Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exams at the same time by applying a Graph coloring b Matching c Topological sort d Eulerian graph Answer: Graph coloring What is the worst-case time for mergesort to sort an array of n elements? a O(nlgn) b O(n) c O(n2) d O(lgn) Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? a O(nlgn) b O(n) c O(n2) d O(lgn) Answer: O(n2) Answer: a b c d What is the worst-case time for heapsort to sort an array of n elements? O(nlgn) O(n) O(n2) O(lgn)  
  
Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? a O(nlgn) b O(n) c O(n2) d None of the others  
  
Answer: O(n) What is the worst-case time for binary search finding a single item in an array? a Constant time b Logarithmic time c Linear time d Quadratic time Answer: Logarithmic time What is the best definition of a collision in a hash table? a Two entries are identical except for their keys. b Two entries with different data have the exact same key. c Two entries with different keys have the same exact hash value. d Two entries with the exact same key have different hash values. Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? a 256 b 511 c 512 d 1024 e There is no maximum Answer: There is no maximum Suppose you place m items in a hash table with an array size of s. What is the c orrect formula for the load factor? a s + m b s/m c s \* m d m/s e m - s Answer: m/s Which of the following data structure can be implement Huffman Coding b Singly linked list. c Priority queue. d All of the others e Doubly linked list. Answer: Doubly linked list. Select incorrect statements about restrictions need to be imposed on the prospec tive codes: a Each codeword may corresponds to one or many symbols. b Assume that symbols and have probabilities of occurrence , . If , t hen , where and . c Decoding should not require any look ahead. d There should not be any unused short codewords either as stand-alone enc odings or as prefixes for longer codewords. Answer: Each codeword may corresponds to one or many symbols. Answer: Select correct statement about Run-length encoding. a A serious drawback of run-length encoding is that it relies entirely on  
  
the occurrences of runs. b Run-length encoding is very useful when applied to files that are almost guaranteed to have many runs of at least five characters. c All of the others. d None of the others. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select a b c d correct statement about Ziv-Lempel Code. Ziv-Lempel Code uses buffer of symbols. The codeword of Ziv-Lempel Code is a triple. All of the others. None of the others.  
  
Answer: All of the others. Which statement is true about the following code? a Interface1 and Interface2 do not match, therefore, MyClass cannot implem ent them both. b The declarations of void g() in the two interfaces conflict, therefore, the code will not compile. c The declarations of int VAL\_B in the two interfaces conflict, therefore, the code will not compile. d Nothing is wrong with the code, it will compile without errors. Answer: Nothing is wrong with the code, it will compile without errors. What will be the result of attempting to compile and run a The program will fail to compile. b The program will compile without error and print c The program will compile without error and print d The program will compile without error and print the following program? 0 when run. 1 when run. 2 when run.  
  
Answer: The program will compile without error and print 2 when run. Which digits, and in which order, will be run? a The program will only print 1 and b The program will only print 1, 4, c The program will only print 3 and d The program will only print 1, 2, printed when the following program is 4, in that order. and 5, in that order. 5, in that order. 4, and 5, in that order.  
  
Answer: The program will only print 1, 4, and 5, in that order. Consider the following pseudocode: What is written to the screen for the input "ABBAABBA"? a ABABABAB b BABABABA c ABBAABBA d BAABBAAB Answer: ABBAABBA Consider the following method: What values of number are directly handled by the stopping case? a number < 0 b number < 10 c number >= 0 && number < 10 d number > 10  
  
Answer: number >= 0 && number < 10 Consider the following sort algorithm: Number of comparisons of keys and comparisons of i and least is: a (n(n-1))/2 b n-1 c ((n-1)(n+2))/2 d None of the others. Answer: ((n-1)(n+2))/2 Consider the following sort algorithm: Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. What is outpu t after iteration i=4 of the outer for loop completed a 1, 2, 3, 4, 5, 6, 7 b 1, 2, 3, 7, 4, 5, 6 c 1, 2, 3, 4, 5, 7, 6 d 1, 2, 3, 4, 7, 5, 6 Answer: 1, 2, 3, 4, 5, 7, 6 Consider the following sort algorithm: Number of comparisons of keys is (n(n-1))/2 Answer: (n(n-1))/2 Consider the following algorithm: Which traversal does the above algorithm implement? a Breadth-first traversal b Inorder tree traversal c Postorder tree traversal d Preorder tree traversal Answer: Preorder tree traversal Consider the following sort algorithm: Select correct statements when applying this algorithm to a n-element array: a moveDown() is called times to create the heap in the first phase. b The heap is restored times in the second phase. c In the second phase, this algorithm exchanges times the root with the e lement in position. d All of the others. Answer: All of the others. Consider this method declaration: How many asterisks are printed by the method call quiz(5)? a 8 b 4 c 7 d None of the others. Answer: 7 Consider the following traversal algorithm: What is output if this algorithm is executed on the following binary tree: a 40 30 7 10 11 3 1 2 14 b 1 3 2 7 10 40 30 11 14 c 1 2 3 14 7 10 11 40 30  
  
d  
  
14 2 1 3 11 10 7 30 40  
  
Answer: 40 30 7 10 11 3 1 2 14 Consider the following algorithm What is output if this algorithm is executed on the following binary tree a 3 b 9 c 5 d 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception? a x = y; b z = x; c y = (B) x; d z = (C) y; e y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same package as the class of the method. How can such a restriction be enforce d? a Declare the method with the keyword public. b Declare the method with the keyword protected. c Declare the method with the keyword private. d Do not declare the method with any accessibility modifiers. Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? a \_class b $value$ c zer@ d Angs\_trom Answer: zer@ Which statement concerning the switch construct is true? a All switch statements must have a default label. b A character literal can be used as a value for a case label c The keyword continue can never occur within the body of a switch stateme nt. d All of the others. Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? a (new Integer(str)).intValue() b Integer.intValue(str) c Integer.getInt(str) d ((int) str) Answer: (new Integer(str)).intValue() Select correct statements about a singly linked list.  
  
a b . c d  
  
Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list All of the others None of the others.  
  
Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: a Quick searching. b All of the others. c None of the others. d Size can be expanded and shrunk rapidly. Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: a Insert a node into any position in Linked List. b Delete a node in position which is followed by the last node. c All of the others. d None of the others. Answer: All of the others. Select correct statements about a singly linked list. a A new node can be inserted into any position, except first position, wit hout any traversal. b Deleting a node at the beginning of a list involves setting head to poin t to head.next. c All of the others. d None of the others. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Propertie of a stack is: a Multiple-items can be accessed at once. b Only one item can be accessed at once. c None of the others. Answer: Only one item can be accessed at once. Properties of a queue are: a Only one item can be accessed at once. b Multiple-items can be accessed at once. c None of the others. Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? a is\_empty b topEl c pop d push when the array is not yet full. e None of these operations require linear time. Answer: None of these operations require linear time.  
  
In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. a is\_empty b topEl c pop d push. e None of these operations require linear time. Answer: pop Select wrong statements: a Recursion is always more efficient than loops. b Recursion can make the conceptual design of an algorithm s implementation easier. c Recursion gone wrong can lead to overflow stack errors d Recursion can be only replaced by iteration. Answer: Recursion can be only replaced by iteration. In a single method declaration, what is the maximum number of statements that ma y be recursive calls? a 1 b 2 c n (where n is the argument). d There is no fixed maximum Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: a Recursion. b Iteration. c Stack. d All of the others. Answer: All of the others. Consider algorithm of the 8-queen problem: putQueen(row) for every position col on the same row if position col is available place the next queen in position col; if (row < 8) putQueen(row+1); else success; remove the queen from position col; Which of the following statements are true: a The algorithm end after finding one solution. b The algorithm does not find symmetric solutions. c The algorithm finds all solutions. Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? a 10 b 15 c 20 d 30  
  
Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? a The rightmost node of the left subtree of the deleted node. b The smallest sibling node. c The parent node. d None of the others. Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . a The DSW algorithm. b AVL tree. c Creating a binary search tree from an ordered array. d None of the others. Answer: AVL tree. The DSW Algorithm uses: a Right rotation. b Left rotation. c All of the others. d None of the others. Answer: All of the others. The depth-first search algorithm for a graph: a Searches for the minimal edges needed to visit each vertex in the graph. b Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. c Checks all adjacent vertices before moving down the paths to find the de stination. d None of the others. Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right statements: a Djikstra's shortest path algorithm can be applied to undirected graph. b The breadth-first search can be used to find the shortest path from a so urce vertex to the destination vertex c All of the others. d None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? a The Kruskal algorithm. b The Dijkstra algorithm. c All of the others. d None of the others. Answer: All of the others. Which of the following statements about shortest path finding algorithms are tru e: a Dijkstra s algorithm is label-setting algorithm.  
  
b c ertices d  
  
Dijkstra s algorithm can be applied to graphs have negative weights. The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of v of graph. All of the others.  
  
Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? a Each component of the array requires a large amount of memory. b Each component of the array requires a small amount of memory. c The array has only a few items out of place. d The processor speed is fast. Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? a The array elements form a heap. b Elements in each half of the array are sorted amongst themselves. c Elements in the first half of the array are less than or equal to elemen ts in the second half of the array. d None of the others Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? a The algorithm might be either selectionsort or insertionsort. b The algorithm might be selectionsort, but it is not insertionsort. c The algorithm is not selectionsort, but it might be insertionsort. d The algorithm is neither selectionsort nor insertionsort. Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: a The first item of array. b The middle item of array. c The last item of array. d All of the others. Answer: All of the others. The more complex the hashing functions, the better it is a True b False Answer: False Which of the following methods are used to collision resolution: a Folding. b Cichelli s method. c Open addressing. d FHCD Answer: Open addressing. Which of the following hashing methods can cause collision:  
  
a b c d e  
  
Division Folding Mid-Square Extraction All of the others.  
  
Answer: All of the others. Select incorrect statements: a Quadratic probing eliminates primary clustering but suffers from the les s severe secondary clustering. b In double hashing the step size depends on the key and is obtained from a secondary hash function. c In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. d None of the others. Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: a Each codeword corresponds to exactly one symbol. b No codeword is a prefix of another codeword. c The length of the codeword for a given symbol mj should not exceed the l ength of the codeword of a less probable symbol mÂ¬i. Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others Answer: Huffman algorithm can be only applied to text files. Answer: The Huffman algorithm always produces a unique binary tree. a True b False Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. a True b False Answer: True Select incorrect statements about Data compression: a Huffman tree can be only constructed bottom-up. b In adaptive Huffman encoding, sibling property is retained assures the H  
  
uffman tree under construction is still a Huffman tree. c All of the others. d None of the others. Answer: Huffman tree can be only constructed bottom-up. Given the following interface definition, which definition is valid? interface B extends I{ void increment(); } Answer: interface B extends I{ void increment(); } Which expressions will evaluate to true if preceded by the following code? a (a == "Hello") b (a == b) c (a == c) d a.equals(b) Answer: (a == c) || a.equals(b) Consider the following alogorithm: What is output when calling TriangularNumber(4) a 6 b 10 c 15 d 20 Answer: 10 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10) a 7 b 9 c 11 d 13 Answer: 11 Consider the following alogorithm: What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? a 4 b 5 c 3 d 6 Answer: 5 Consider the following alogorithm: What is maximum number of elements in queue when traversing the below tree using the above algorithm? a 4 b 5 c 6 d 3 Answer: 4 onsider the following alogorithm: Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first  
  
loop. a b c d {15,12,2,11,10,6,3,1,8} {15,12,6,11,10,2,3,1,8} {8,12,6,11,10,2,3,1,15} None of the others  
  
Answer: {15,12,6,11,10,2,3,1,8} Consider the following alogorithm: Select right statements: a In the first loop, moveDown is called n/2 times in any case. b The total number of moves in all executions of moveDown in the second ph ase is O(lgn). c All of the others. d None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. What will be printed when the following program is run? a 0 b 1 c 2 d An error occurs when compiling the program. Answer: 2 What will be printed when the following program is run? a this is g of A b this is g of C c An error occurs when compiling the program. d Nothing is printed. Answer: this is g of C  
  
Consider the following alogorithm: Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. a {3,4,8,10,12,17,5,14,13} b {3,4,10,8,12,17,5,14,13} c {10,8,4,3,12,17,5,14,13} d {3,4,5,8,10,12,13,14,17} Answer: {3,4,8,10,12,17,5,14,13} Consider the following alogorithm How many times is number 840 printed out when call pattern(840) a 2 b 4 c 6 d 8 Answer: 2 Consider the following alogorithm: How many integers will the program print when calling nonTail(n), n > 0. a 2n b 2n - 1 c 2n d 2n -1  
  
Answer: 2n - 1 Consider the following alogorithm: The above algorithm is used to: a Count number of even values in binary tree. b Print even numbers in binary tree. c Print even numbers in ascending order. d Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Consider the following alogorithm: a Count number of nodes in binary tree. b Calculate height of binary tree. c Count number of nonterminal nodes in binary tree. d None of the others. Answer: Calculate height of binary tree. Consider the following alogorithm: The above algorithm is used to: a Check whether binary tree is balanced. b Check whether height of left subtree is greater than height of right sub tree. c Check whether height of right subtree is greater than height of left sub tree. d None of the others. Answer: Check whether binary tree is balanced. Question 1:Which statements are true about inheritance? a.In Java the extends clause is used to specify inheritance b.A subclass must define all the methods from the superclass. c.A class can extend any number of other classes. d.All of the others. Answer:In Java the extends clause is used to specify inheritance Question 2:Which statements are true about interfaces? a.The keyword implements is used to specify that a class inherits from an interf ace b.Members of an interface can always be declared static. c.Interfaces can extend any number of other interfaces. d.None of the others. Answer:Interfaces can extend any number of other interfaces. Question 3:Which statements are false a.for (int i=10; i=0; i--) {} b.for (int i=0, j=100; i0); i--) {} Answer:for (int i=0, j=100; i  
   
Question 4:Suppose temp refers to a node in a linked list (using the SLLNode cla ss with instance variables called info and next). What boolean expression will b e true when temp refers to the tail node of the list? a.(temp == null) b.(temp.next == null) c.(temp.info == null) d.None of the above. Answer:(temp.next == null)  
  
Question 5:Suppose temp refers to a node in a linked list (using the SLLNode cla ss with instance variables called info and next). What statement changes temp so that it refers to the next node? a.temp++; b.temp=next; c.temp+=next; d.temp=temp.next; Answer:temp=temp.next; Question 6:Which boolean expression indicates whether the data in two nodes (p a nd q) are the same. Assume that neither p nor q is null. a.p==q; b.p.info==q.info; c.p.next=q.next; d.None of the others Answer:.p.info==q.info; Question 7:Which of these operations are likely to have a constant time for wors t-case in the linked lists? a.addBefore (add a new element into before an element in the list).. b.countOccurrences (count number of an element s present times in the list). c.Delete (remove an element in the list). d.None of the others. Answer:None of the others. Question 8:The operation for adding an entry to a stack is traditionally called: a.add b.append c.insert d.push Answer:push Question 9:In the array version of the Queue, which operations require O(n) time for their worst-case behavior? a.dequeue b.insert when the capacity has not yet been reached c.isEmpty d.None of the others Answer:None of the others Question 10:Which of the following applications may use a stack? a.A parentheses balancing program. b.Keeping track of local variables at run time. c.Syntax analyzer for a compiler. d.All of the others. Answer:All of the others. Question 11:In the linked-list version of the Queue, which operations require li near time for their worst-case behavior? a.dequeue b.insert c.isEmpty d.None of the others Answer:None of the others Question 12:When a method call is executed, which information is not saved in th e activation record? a.Local variables b.Location where the method should return when done. c.Current depth of recursion.  
  
d.Values for all parameters to the method. Answer:Current depth of recursion. Question 13:When the compiler compiles your program, how is a recursive call tre ated differently than a non-recursive method call? a.Primitive values are all treated as reference variables b.Reference variables are all treated as primitive values c.There is no duplication of local variables d.None of the others Answer:None of the others Question 14: a. b. c. d. Answer: Question 15:Select the one TRUE statement. a.Every binary tree is either balanced or perfect balanced. b.Every balanced binary tree is also a perfect balanced binary tree. c.Every perfect balanced binary tree is also a balanced binary tree. d.No binary tree is both balanced and perfect balanced. Answer:Every perfect balanced binary tree is also a balanced binary tree. Question 16:\_\_\_\_\_\_\_\_ is visiting node starting from the highest (or lowest) leve l and moving down (or up) level by level, visiting nodes on each level from left to right (or from right to left). a.Breath-First Traversal b.Depth-First Traversal c.Stackless Depth-First Traversal d.None of the others Answer:Breath-First Traversal Question 17:\_\_\_\_\_\_\_\_ rebalances the tree globally; each and every node could hav e been involved in rebalancing either by moving data from nodes or by creasing n ew values to reference fields. a.The DSW Algorithm b.One classical method has been proposed by Adel son Vel skii and Landis (AVL tree). c.All of the others d.None of the others Answer:The DSW Algorithm Question 18:A heap is an exellent way to implement a \_\_\_\_\_\_\_\_ a.stack b.queue c.priority queue d.tree. Answer:priority queue Question 19:What is the expected number of operations needed to loop through all the edges terminating at a particular vertex given an adjacency matrix represen tation of the graph? (Assume n vertices are in the graph and m edges terminate a t the desired node). a.O(m) b.O(n) c.O(m2) d.O(n2) Answer:O(n)  
  
Question 20:What graph traversal algorithm uses a queue to keep track of vertice s which need to be processed? a.Breadth-first search. b.Depth-first search. c. d. Answer:Breadth-first search. Question 21:Suppose you have a directed graph representing all the flights that an airline flies. What algorithm might be used to find the best sequence of conn ections from one city to another? a.Breadth first search. b.Depth first search. c.A cycle-finding algorithm. d.A shortest-path algorithm. Answer:A shortest-path algorithm. Question 22:The final exams at a university can be scheduled so that no student has two exams at the same time by applying \_\_\_\_\_\_\_\_\_\_ a.Graph coloring b.Matching c.Topological sort d.Eulerian graph Answer:Graph coloring Question 23:What is the worst-case time for mergesort to sort an array of n elem ents? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(nlgn) Question 24:What is the worst-case time for bublesort to sort an array of n elem ents? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(n2) Question 25:What is the worst-case time for heapsort to sort an array of n eleme nts? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(nlgn) Question 26:In a selectionsort of n elements, how many times are the array eleme nts moved in the worst case? a.O(nlgn) b.O(n) c.O(n2) d.O(lgn) Answer:O(n) Question 27:What is the worst-case time for binary search finding a single item in an array? a.Constant time  
  
b.Logarithmic time c.Linear time d.Quadratic time Answer:Logarithmic time Question 28:What is the best definition of a collision in a hash table? a.Two entries are identical except for their keys. b.Two entries with different data have the exact same key. c.Two entries with different keys have the same exact hash value d.Two entries with the exact same key have different hash values. Answer:have the same exact hash value Question 29:A chained hash table has an array size of 512. What is the maximum n umber of entries that can be placed in the table? a.256 b.511 c.512 d.1024 e.There is no maximum Answer:There is no maximum Question 30:Suppose you place m items in a hash table with an array size of s. W hat is the correct formula for the load factor? a.s + m b.s/m c.s \* m d.m/s e.m - s Answer:m/s Question 31:Which of the following data structure can be implement Huffman Codin g a.Singly linked list. b.Priority queue. c.All of the others d.Doubly linked list. Answer:All of the others Question 32:Select incorrect statements about restrictions need to be imposed on the prospective codes: a.Each codeword may corresponds to one or many symbols. b.Assume that symbols and have probabilities of occurrence , . If , then , where and . c.Decoding should not require any look ahead. d.There should not be any unused short codewords either as stand-alone encodings or as prefixes for longer codewords. Answer:Each codeword may corresponds to one or many symbols. Question 33:Select correct statement about Run-length encoding. a.A serious drawback of run-length encoding is that it relies entirely on the oc currences of runs. b.Run-length encoding is very useful when applied to files that are almost guara nteed to have many runs of at least five characters. c.All of the others. d.None of the others. Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs. Question 34:Select correct statement about Ziv-Lempel Code. a.Ziv-Lempel Code uses buffer of symbols.  
  
b.The codeword of Ziv-Lempel Code is a triple. c.All of the others. d.None of the others. Answer:All of the others. Question 35:Which statement is true about the following code? a.Interface1 and Interface2 do not match, therefore, MyClass cannot implement th em both. b.The declarations of void g() in the two interfaces conflict, therefore, the co de will not compile. c.The declarations of int VAL\_B in the two interfaces conflict, therefore, the c ode will not compile. d.Nothing is wrong with the code, it will compile without errors. Answer:Nothing is wrong with the code, it will compile without errors. Question 36:What will be the result of attempting to ng program? a.The program will fail to compile. b.The program will compile without error and print 0 c.The program will compile without error and print 1 d.The program will compile without error and print 2 Answer:and print 2 when run compile and run the followi when run. when run. when run.  
  
Question 37:Which digits, and in which order, will be printed when the following program is run? a.The program will only print 1 and 4, in that order. b.The program will only print 1, 4, and 5, in that order. c.The program will only print 3 and 5, in that order. d.The program will only print 1, 2, 4, and 5, in that order. Answer:1, 4, and 5, in that order. Question 38:What is written to the screen for the input "ABBAABBA"? a.ABABABAB b.BABABABA c.ABBAABBA d.BAABBAAB Answer:ABBAABBA Question 39:What values of number are directly handled by the stopping case? a.number < 0 b.number < 10 c.number >= 0 && number < 10 d.number > 10 Answer:number >= 0 && number < 10 Question 40:Number of comparisons of keys and comparisons of i and least is: a.n(n-1)\2 b.n-1 c.(n-1)(n+2)\2 d.None of the others. Answer:(n-1)(n+2)\2 Question 41:Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. W hat is output after iteration i=4 of the outer for loop completed a.1, 2, 3, 4, 5, 6, 7 b.1, 2, 3, 7, 4, 5, 6 c.1, 2, 3, 4, 5, 7, 6 d.1, 2, 3, 4, 7, 5, 6 Answer:1, 2, 3, 4, 5, 7, 6  
  
Question 42:Number of comparisons of keys is a.n(n+1)\2 b.n(n-1)\2 c.n^2 d.n^2\2 Answer:n(n-1)\2 Question 43:Which traversal does the above algorithm implement? a.Breadth-first traversal b.Inorder tree traversal c.Postorder tree traversal d.Preorder tree traversal Answer:Preorder tree traversal Question 44:Select correct statements when applying this algorithm to a n-elemen t array: a.moveDown() is called times to create the heap in the first phase. b.The heap is restored times in the second phase. c.In the second phase, this algorithm exchanges times the root with the element in position. d.All of the others. Answer:All of the others. Question 45:How many asterisks are printed by the method call quiz(5)? a.8 b.4 c.7 d.None of the others. Answer:7 Question 46:What is output if this algorithm is executed on the following binary tree: a.40 30 7 10 11 3 1 2 14 b.1 3 2 7 10 40 30 11 14 c.1 2 3 14 7 10 11 40 30 d.14 2 1 3 11 10 7 30 40 Answer:40 30 7 10 11 3 1 2 14 Question 47:What is output if this algorithm is executed on the following binary tree2: a.3 b.9 c.5 d.8 Answer:5 Question 48:Which statement, when inserted at the indicated position in the foll owing code, will cause a runtime exception? a.x = y; b.z = x; c.y = (B) x; d.z = (C) y; e.y = (A) y; Answer: Question 49:Which statements are false about modifiers? a.A final methods or field cannot be changed by derived classes. b.Methods and fields declared public can be used by any other object. c.The default modifier means that a method or a field is a accessible to derived classes.  
  
d.None of the others. Answer:The default modifier means that a method or a field is a accessible to de rived classes. Question 50:A method within a class is only accessible by classes that are defin ed within the same package as the class of the method. How can such a restrictio n be enforced? a.Declare the method with the keyword public. b.Declare the method with the keyword protected. c.Declare the method with the keyword private. d.Do not declare the method with any accessibility modifiers. Answer:Do not declare the method with any accessibility modifiers. Question 51:Which are invalid identifiers? a.\_class b.$value$ c.zer@ d.Angs\_trom Answer:zer@ Question 52:Which statement concerning the switch construct is true? a.All switch statements must have a default label. b.A character literal can be used as a value for a case label c.The keyword continue can never occur within the body of a switch statement. d.All of the others. Answer:A character literal can be used as a value for a case label Question 53:If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? a.(new Integer(str)).intValue() b.Integer.intValue(str) c.Integer.getInt(str) d.((int) str) Answer:(new Integer(str)).intValue() Question 54:Select correct statements about a singly linked list. a.Linked lists allow random access to any node. b.A node with a specified value (info) can be found by traversing the list. c.All of the others d.None of the others Answer:A node with a specified value (info) can be found by traversing the list. Question 55:Advantages which linked list have over an array: a.Quick searching. b.All of the others. c.None of the others. d.Size can be expanded and shrunk rapidly. Answer:Size can be expanded and shrunk rapidly. Question 56:Which of the following methods take O(n) time for the worst case: a.Insert a node into any position in Linked List. b.Delete a node in position which is followed by the last node. c.All of the others. d.None of the others. Answer:All of the others Question 57:Select correct statements about a singly linked list. a.A new node can be inserted into any position, except first position, without a ny traversal. b.Deleting a node at the beginning of a list involves setting head to point to h  
  
ead.next. c.All of the others. d.None of the others. Answer:Deleting a node at the beginning of a list involves setting head to point to head.next. Question 58:Propertie of a stack is: a.Multiple-items can be accessed at once. b.Only one item can be accessed at once. c.None of the others. d. Answer:Only one item can be accessed at once. Question 59:Properties of a queue are: a.Only one item can be accessed at once. b.Multiple-items can be accessed at once. c.None of the others. d. Answer:Only one item can be accessed at once. Question 60:In the array version of the Stack class, which operations require li near time for their worst-case behavior? a.is\_empty b.topEl c.pop d.push when the array is not yet full. e.None of these operations require linear time. Answer:None of these operations require linear time. Question 61:In the linked-list version of the Stack class, which operations requ ire linear time for their worst-case behavior? Assume that addtoTail, deletefrom Tail are used. a.is\_empty b.topEl c.pop d.push when the array is not yet full. e.None of these operations require linear time. Answer:pop Question 62:Select wrong statements: a.Recursion is always more efficient than loops. b.Recursion can make the conceptual design of an algorithm s implementation easier . c.Recursion gone wrong can lead to overflow stack errors d.Recursion can be only replaced by iteration. Answer:Recursion is always more efficient than loops. Question 63:In a single method declaration, what is the maximum number of statem ents that may be recursive calls? a.1 b.2 c.n (where n is the argument). d.There is no fixed maximum Answer:There is no fixed maximum Question 64:The problem of printing an input line in reverse order can be implem ented using: a.Recursion. b.Iteration. c.Stack.  
  
d.All of others Answer:Recursion Question 65:Which of the following statements are true: a.The algorithm end after finding one solution. b.The algorithm does not find symmetric solutions. c.The algorithm finds all solutions. d. Answer:The algorithm finds all solutions. Question 66:On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? a.10 b.15 c.20 d.30 Answer:20 Question 67:To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? a.The rightmost node of the left subtree of the deleted node. b.The smallest sibling node. c.The parent node. d.None of the others. Answer:The rightmost node of the left subtree of the deleted node. Question 68:Tree balancing can be performed locally after an element is inserted into or deleted from the tree using . a.The DSW algorithm. b.AVL tree. c.Creating a binary search tree from an ordered array. d.None of the others. Answer:AVL tree. Question 69:The DSW Algorithm uses: a.Right rotation. b.Left rotation. c.All of the others. d.None of the others. Answer:All of the others. Question 70:The depth-first search algorithm for a graph: a.Searches for the minimal edges needed to visit each vertex in the graph. b.Travels all possible paths from a vertex to see if it can find the destination before it moves on to the adjacent vertices. c.Checks all adjacent vertices before moving down the paths to find the destinat ion. d.None of the others. Answer:Travels all possible paths from a vertex to see if it can find the destin ation before it moves on to the adjacent vertices. Question 71:Select right statements: a.Djikstra's shortest path algorithm can be applied to undirected graph. b.The breadth-first search can be used to find the shortest path from a source v ertex to the destination vertex c.All of the others. d.None of the others. Answer:All of the others. Question 72:Two algorithms which used for finding a minimum spanning tree are Kr uskal and Dijkstra. Which algorithm uses the cycle detection method?  
  
a.The Kruskal algorithm. b.The Dijkstra algorithm. c.All of the others. d.None of the others. Answer:All of the others. Question 73:Which of the following statements about shortest path finding algori thms are true: a.Dijkstra s algorithm is label-setting algorithm. b.Dijkstra s algorithm can be applied to graphs have negative weights. c.The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertice s of graph. d.All of the others. Answer:Dijkstra s algorithm is label-setting algorithm. Question 74:When is Insertionsort a good choice for sorting an array? a.Each component of the array requires a large amount of memory. b.Each component of the array requires a small amount of memory. c.The array has only a few items out of place. d.The processor speed is fast. Answer:The array has only a few items out of place. Question 75:Mergesort makes two recursive calls. Which statement is true after t hese recursive calls finish, but before the merge step? a.The array elements form a heap. b.Elements in each half of the array are sorted amongst themselves. c.Elements in the first half of the array are less than or equal to elements in the second half of the array. d.None of the others Answer:Elements in each half of the array are sorted amongst themselves. Question 76:Suppose we are sorting an array of eight integers using a some quadr atic (O(n2))) sorting algorithm. After four iterations of the algorithm's main l oop, the array elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? a.The algorithm might be either selectionsort or insertionsort. b.The algorithm might be selectionsort, but it is not insertionsort. c.The algorithm is not selectionsort, but it might be insertionsort. d.The algorithm is neither selectionsort nor insertionsort. Answer:not selectionsort, but it might be insertionsort. Question 77:In Quicksort, the bound value (pivot) is: a.The first item of array. b.The middle item of array. c.The last item of array. d.All of the others. Answer:All of the others. Question 78:The more complex the hashing functions, the better it is a.True b.False c. d. Answer:b.False Question 79:Which of the following methods are used to collision resolution: a.Folding b.Cichelli s method. c.Open addressing.  
  
d.FHCD Answer:Open addressing. Question 80:Which of the following hashing methods can cause collision: a.Division b.Folding c.Mid-Square d.Extraction e.All of others Answer:All of others Question 81:Select incorrect statements: a.Quadratic probing eliminates primary clustering but suffers from the less seve re secondary clustering. b.In double hashing the step size depends on the key and is obtained from a seco ndary hash function. c.In quadratic probing the offset from x is the square of the step number, so th e probe goes to x, x+1, x+2, x+3, x+4, and so on. d.None of the others. Answer:In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Question 82:Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: a.Each codeword corresponds to exactly one symbol. b.No codeword is a prefix of another codeword. c.The length of the codeword for a given symbol mj should not exceed the length of the codeword of a less probable symbol mÂ¬i. d.all of otehrs Answer:No codeword is a prefix of another codeword. Question 83:Select incorrect statements about Data compression: a.Huffman algorithm can be implemented using priority queue. b.Huffman algorithm applied to case of the probabilities of symbol are known in advance. c.Huffman algorithm can be only applied to text files. d.All of the others Answer:Huffman algorithm can be only applied to text files. Question 84:The Huffman algorithm always produces a unique binary tree. a.True b.False c. d. Answer:False Question 85:Select incorrect statements about Data compression: a.Huffman tree can be only constructed bottom-up. b.In adaptive Huffman encoding, sibling property is retained assures the Huffman tree under construction is still a Huffman tree. c.All of the others. d.None of the others. Answer:Huffman tree can be only constructed bottom-up. Question 86:Given the following interface definition, which definition is valid?  
  
Which expressions will evaluate to true if preceded by the following code? a.(a == "Hello") b.(a == b) c.(a == c) d.a.equals(b) Answer:a.equals(b);(a == c) Question 87:is output when calling TriangularNumber(4) a.6 b.10 c.15 d.20 Answer:10 Question 88:What is maximum number of activation records (including its caller) in runtime stack when calling TriangularNumber(10) a.7 b.9 c.11 d.13 Answer:11 Question 89:What is maximum number of activation records (including its caller) in runtime stack when traversing the below tree using the above algorithm? a.4 b.5 c.3 d.6 Answer:5 Question 90:Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after endi ng the first loop. a.{15,12,2,11,10,6,3,1,8} b.{15,12,6,11,10,2,3,1,8} c.{8,12,6,11,10,2,3,1,15} d.None of the others Answer:{15,12,6,11,10,2,3,1,8} Question 91:Select right statements: a.In the first loop, moveDown is called n/2 times in any case. b.The total number of moves in all executions of moveDown in the second phase is O(lgn). c.All of the others. d.None of the others. Answer:In the first loop, moveDown is called n/2 times in any case. Question 92:What will be printed when the following program is run? a.0 b.1 c.2 d.An error occurs when compiling the program. Answer: Question 93:What will be printed when the following program is run? a. this is g of A b. this is g of C c.An error occurs when compiling the program. d.Nothing is printed. Answer: this is g of C  
  
Question 94:Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after exe cuting 4 iterations of outer loop. a.{3,4,8,10,12,17,5,14,13} b.{3,4,10,8,12,17,5,14,13} c.{10,8,4,3,12,17,5,14,13} d.{3,4,5,8,10,12,13,14,17} Answer:{3,4,8,10,12,17,5,14,13} Question 95:How many times is number 840 printed out when call pattern(840) a.2 b.4 c.6 d.8 Answer:2 Question 96:How many integers will the program print when calling nonTail(n), n > 0. a.2^n b.2^n-1 c.2n d.2n-1 Answer:2^n-1 Question 97:The above algorithm is used to: a.Count number of even values in binary tree. b.Print even numbers in binary tree. c.Print even numbers in ascending order. d.Print and count number of even values in binary tree. Answer:in binary tree. Question 98:The above algorithm is used to: a.Count number of nodes in binary tree. b.Calculate height of binary tree. c.Count number of nonterminal nodes in binary tree. d.None of the others. Answer:Calculate height of binary tree. Question 99:above algorithm is used to: a.Check whether binary tree is balanced. b.Check whether height of left subtree is greater than height of right subtree. c.Check whether height of right subtree is greater than height of left subtree. d.None of the others. Answer:Check whether binary tree is balanced. Question 100: a. b. c. d. Answer: Quiz Chapter 03 Question 1 Marks: 1 Which of the following operations are implemented in the ArrayList class belongs to the java.util package: Choose one answer. a. Update one element in any position in the ArrayList. b. Add one element to any position in the ArrayList. c. All of the others. d. Retrieve one element from any position in the ArrayList.  
  
Answer: All of the others. Question 2 Marks: 1 If an algorithm is constantly accessing only some elements such as the first, th e second, the last and the like, and if changing the structure is very important to the algorithm then solution is using: Choose one answer. a. Linked list. b. Array. c. None of the others Answer: Linked list. Question 3 Marks: 1 Select correct statement(s) about Doubly Linked List: Choose at least one answer. a. Deleting a node at the end of the list takes time O(1) . b. Methods for processing doubly linked list are simpler than those of s ingly linked list. c. Inserting a new node at the end of the list requires O( n ) steps. d. Processing for adding a node to the end of list includes six steps. Answer: Deleting a node O(1)+ Inserting a new node O( n ) Question 4 Marks: 1 The advantage of arrays over linked lists is that they allow random accessing. Answer: True Question 5 Marks: 1 Elements of a linked list must be consecutive memory cells. Answer: False Quiz Chapter 04 Question 1 Marks: 1 In the array implementation, enqueuing can be executed in constant time O(1) Answer: True Question 2 Marks: 1 Select false statement: Choose one answer. a. All of the others. b. In the array list implementation, popping is executed in constant tim e O(1). c. In the array list implementation, poping is executed in O(lgn) to the worst case. d. Stack can be implemented using linked list. Answer: In the array list implementation, poping is executed in O(lgn) to the wo rst case. Question 3 Marks: 1 Which of the following about queue are true: Choose one answer. a. A queue is a structure in which adding and removing elements only tak e place at one end. b. None of the others. c. A queue is an FIFO structure. d. A queue is a structure in which each end can be used for adding new e lements and removing them. Answer: A queue is an FIFO structure. Question 4 Marks: 1  
  
In the array implementation, dequeuing can be executed in time O(n) Answer: False Question 5 Marks: 1 In the doubly linked list implementation, enqueuing can be executed in time O(n) Answer: False Quiz Chapter 05 Question 1 Marks: 1 Select incorrect statement: Choose one answer. a. Recursive definitions are frequently used to define functions and seq uences of numbers. b. None of the others c. Recursive definitions serve generating new elements and testing wheth er an element belongs to a set. d. The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed. Answer: The anchor or ground case allows for the construction of new objects out of basic elements or objects that have already been constructed. Question 2 Marks: 1 Consider the following recursive function, assuming n is even: h(n)={1ifn=01+h(n-2)n>1 What is the value of h(20): Choose one answer. a. 9 b. 11 c. 12 d. 10 Answer: 11 Question 3 Marks: 1 When converting a method from a recursive version into an iterative version, Choose at least one answer. a. The program always runs slower. b. The brevity of program formulation lost. However, the brevity may not be an issue in Java. c. Program clarity can be diminished. d. The brevity of program formulation lost. Answer: Program clarity+the brevity of program formulation lost Question 4 Marks: 1 In all cases, nonrecursive implementation is faster than recursive implementatio n. Answer: False Question 5 Marks: 1 Which of the following statements are true: Choose at least one answer. a. The recursive version increases program readability, improves self-do cumentation and simplifies coding. b. The return address is address of the caller's instruction immediately following the call. c. In the most cases, the code of nonrecursive implementation is shorter than it is in the recursive implementation. d. Global variables are stored in activation record. Answer: The recursive version increases + The return address is address  
  
Quiz Chapter 06 Question 1 Marks: 1 Which of the following statements about heap are false: Choose one answer. a. Heap represented by array can be traversed easily in depth-first. b. Heaps can be implemented by arrays. c. John Williams's algorithm uses top-down method which extends the heap by enqueuing new elements in the heap. d. Floyd's algorithm uses bottom-up method which merges repetitively sma ll heaps into larger heaps. Answer: Heap represented by array can be traversed easily in depth-first. Question 2 Marks: 1 Which of the following statements are true: Choose at least one answer. a. Preorder, inorder and postorder tree traversal generate unambiguous o utputs. b. Expression trees do not use parentheses. c. Polish notation is only applied for compilers. d. In a expression tree, leaves are operators and nonterminal nodes are operands and. e. Polish notation eliminates all parentheses from formulas. Answer: Polish notation eliminates all parentheses from formulas.+ Expression tr ees do not use parentheses. Question 3 Marks: 1 Which operation is used in DSW Algorithm: Choose one answer. a. Rotation b. None of the others c. All of the others d. Sorting Answer: Rotation Question 4 Marks: 1 Which of the following methods are used to traverse a tree without using any sta ck or threads: Choose one answer. a. None of the others b. Traversal through Tree Transformation c. Recursion Answer: Traversal through Tree Transformation Question 5 Marks: 1 Which of the following concepts of binary tree are true: Choose one answer. a. The level of a node must be between 1 and height of the tree. b. The level of a node is the length of the path from the root to the no de plus 1. c. The height of a nonempty tree is the maximum level of a node in the t ree. d. All of the others Answer: All of the others Quiz Chapter 08 Question 1 Marks: 1 Which graph representation is best? Choose one answer.  
  
a. It depends on the problem. b. Adjacency matrix c. Incidence matrix d. Adjacency list e. None of the others. Answer: It depends on the problem. Question 2 Marks: 1 Which of the following statements about finding the shortest path are true: Choose one answer. a. The complexity of Dijkstra's algorithm is O(|V|2) b. Ford's algorithm relies on label-setting method. c. The complexity of Ford's algorithm is O(|V||E|) for any graph. d. The complexity of Dijkstra's algorithm using heap is O(|V|ln|V|) Answer: The complexity of Dijkstra's algorithm is O(|V|2) Question 3 Marks: 1 Which of the following sentences are true: Choose at least one answer. a. The complexity of DFS for graph traveral is O(|V|+|E|) . b. The complexity of DFS for graph traversal is (O|V|lg|V|) if an adjace ncy matrix is used c. To prevent loop from happen in an algorithm for traversing a graph, e ach visited vertex can be marked. d. All algorithms are more efficient if the underlying graph traversal i s not BFS but DFS. Answer: DFS O(|V|+|E|) + prevent loop from happen in an algorithm for traversin g a graph, each visited vertex can be marked. Question 4 Marks: 1 Which of the following statements about graph coloring is true: Choose at least one answer. a. In sequential coloring algorithm, vertices must be ordered according to indices already to the vertices. b. The complexity of sequential Coloring algorithm is O(|V|2) . c. In sequential coloring algorithm, vertices must be ordered according to degree of vertices. d. Sequential Coloring algorithm establishes the sequence of vertices an d a sequence of color before coloring them. Answer: Coloring algorithm is O(|V|2) + the sequence of vertices and a sequence of color before coloring them. Question 5 Marks: 1 Most of the label-setting and label-correcting methods are used to find the shor test paths from one vertex to all other vertices. Answer: True Quiz Chapter 09 Question 1 Marks: 1 Which of the following statements about efficient sorting is true: Choose at least one answer. a. Only insertion sort is apllied in all h-sorts of shell sort. b. There is no which sequence of increments is optimal. c. Shell sort is more efficient than insertion sort even if in case ther e are only two increments. d. Shell sort divides physically the original array into subarrays and s orts them separately. Answer: divides physically+Only insertion sort Question 2  
  
Marks: 1 Which of the following statements about elementary sorting is true: Choose one answer. a. All of others. b. Advantage of using insertion sort is that it sorts the array only whe n is really necessary. c. In the worst case of bubble sort, number of swaps is n(n-1)4 Answer: Advantage of using insertion sort is that it sorts the array only when i s really necessary. Question 3 Marks: 1 Select correct statements about Radix sort: Choose at least one answer. a. bitRadixsort() is faster than radixsort(). b. bitRadixsort() can be improved by implementing array instead of using queue. c. Radix sort is used only for string sorting. d. One of techniques radix sort uses is by looking at each number as a s tring of bits so that all integers are of equal length. Answer: bitRadixsort() array instead of using queue. + by looking at each number as a string of bits Question 4 Marks: 1 In Insertion sort, which case is only one comparison made for each position i: Choose one answer. a. The data are in reverse order b. None of the others. c. The data are in random order. d. The data are already in order. Answer: The data are already in order. Question 5 Marks: 1 Consider Insertion sort algorithm for a n-element array. The number of times var iable tmp is loaded and unloaded in the outer for loop is: Choose one answer. a. 2(n-1) in the best case. b. 2(n-1) in the worst case. x c. All of the others. Answer: All of the others. Quiz Chapter 10 Question 1 Marks: 1 Which of the following statement about Perfect Hash Functions are true: Choose at least one answer. a. The searching process in Cichelli's algorithm is linear. b. Cichelli's algorithm guarantees that a perfect hash function can be f ound. c. Cichelli's method uses an exhaustive search. d. Cichelli's method is used to hash relatively small number of reserved words. Answer: exhaustive search.+hash relatively Question 2 Marks: 1 Which of the following statement is true: Choose one answer. a. To create a hash function, the hashing table has to contain at least the same number of positions as the number of elements being hashed. b. If hash function transforms different keys into different numbers, it is called a perfect hash function.  
  
c. All of the others. Answer: All of the others. Question 3 Marks: 1 Select correct statements: Choose at least one answer. a. In shift folding method, the key is usually divided into even parts o f some fixed size plus some remainder and added. b. The shift folding method can be applied to string data. c. In boundary folding method, the key is usually divided into even part s of not fixed size plus some remainder and added. d. The boundary folding method can not be applied to string data. Answer: shift ,plus some remainder and added+ boundary , can not be applied to s tring data. Question 4 Marks: 1 Which of the following statement about Open Addressing are false: Choose at least one answer. a. In linear probing of the open addressing method, the position in whic h key can be stored is found by sequentially searching starting from the begin o f table. b. Using quadratic probing gives much better results than linear probing and avoids the problem of cluster buildup. c. For quadratic probing, the size of table should not be an even number . d. Linear probing has a tendency to create clusters in the table. Answer: In linear probing of the open addressing+ Using quadratic probing Question 5 Marks: 1 Hash function is function that can transform a particular key (K) (a string, num ber or record) into an index in the table used for storing items of the same typ e as K. Answer: True Quiz Chapter 11 Question 1 Marks: 1 The length of the codeword for a given symbol mj should not less than the length of the codeword of a less probable symbol mi; that is, if P(mi)=P(mj), then L(m i)=L(mj) for 1=i, j=n Answer: False Question 2 Marks: 1 In data compression, no special punctuation is required to separate two codeword s in a coded message. Answer: True Question 3 Marks: 1 Select correct statement about Ziv-Lempel Code. Choose one answer. a. Ziv-Lempel Code uses buffer of symbols. b. All of the others. c. The codeword of Ziv-Lempel Code is a triple. Answer: All of the others. Question 4 Marks: 1 Which of the following data structure can be used to implement Huffman Coding Choose at least one answer. a. Heap. b. Doubly linked list.  
  
c. Binary tree. d. Stack list. e. Queue. Answer: Heap + Doubly linked list + Binary tree. Question 5 Marks: 1 Run-length encoding is very efficient for text file in which only blank characte r has a tendency to be repeated without using any technique. Answer: True Q1 Which statements are true about inheritance? Answer: In Java the extends clause is used to specify inheritance Q2 Which statements are true about interfaces? Answer: Interfaces can extend any number of other interfaces. Q3 Which one of these for statements is valid Answer: for (int i=0, j=100; i  
   
When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? Answer: None of the others. Select the one TRUE statement. Every binary tree is either balanced or perfect balanced. Every balanced binary tree is also a perfect balanced binary tree. Every perfect balanced binary tree is also a balanced binary tree. No binary tree is both balanced and perfect balanced. Answer: Every perfect balanced binary tree is also a balanced binary tree.  
  
is visiting node starting from the highest (or lowest) level and moving down (or up el by level, visiting nodes on each level from left to right (or from right to l eft). Answer: Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. Answer: DSW Algorithm A heap is an exellent way to implement a Answer: priority queue ..  
  
What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exams at the same time by applying Answer: Graph coloring What is the worst-case time for mergesort to sort an array of n elements? Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? Answer: O(n2) What is the worst-case time for heapsort to sort an array of n elements? Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? Answer: O(n) What is the worst-case time for binary search finding a single item in an array? Answer: Logarithmic time What is the best definition of a collision in a hash table?  
  
Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? Answer: m/s Which of the following data structure can be implement Huffman Coding Answer: All of the others Select incorrect statements about restrictions need to be imposed on the prospec tive codes: Answer: Each codeword may corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer: A serious drawback of run-length encoding is that it relies entirely on the occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer: All of the others. What is written to the screen for the input "ABBAABBA"? Answer: ABBAABBA What values of number are directly handled by the stopping case? number < 0 number < 10 number >= 0 && number < 10 number > 10 Answer: number >= 0 && number < 10 Number of comparisons of keys and comparisons of i and least is: Answer: ((n-1)(n+2))/2 Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. What is outpu t after iteration i=4 of the outer for loop completed Answer: 1, 2, 3, 4, 5, 7, 6 Number of comparisons of keys is Answer: n\*(n-1)/2 Which traversal does the above algorithm implement? Breadth-first traversal Inorder tree traversal Postorder tree traversal Preorder tree traversal Answer: Preorder Select correct statements when applying this algorithm to a n-element array: moveDown() is called times to create the heap in the first phase. The heap is restored times in the second phase. In the second phase, this algorithm exchanges times the root with the element i n position. All of the others. Answer: All of the others. How many asterisks are printed by the method call quiz(5)? Answer: 7 What is output if this algorithm is executed on the following binary tree: 40 30 7 10 11 3 1 2 14 1 3 2 7 10 40 30 11 14  
  
1 2 3 14 7 10 11 40 30 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 3 9 5 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception? x = y; z = x; y = (B) x; z = (C) y; y = (A) y; Answer: y = (B) x; A method within a class is only accessible by classes that are defined within th e same package as the class of the method. How can such a restriction be enforce d? Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers? \_class $value$ zer@ Angs\_trom Answer: zer@ Which statement concerning the switch construct is true? All switch statements must have a default label. A character literal can be used as a value for a case label The keyword continue can never occur within the body of a switch statement. All of the others. Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: new Integer(str)).intValue() Select correct statements about a singly linked list. Linked lists allow random access to any node. A node with a specified value (info) can be found by traversing the list. All of the others None of the others. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list.  
  
A new node can be inserted into any position, except first position, without any traversal. Deleting a node at the beginning of a list involves setting head to point to hea d.next. All of the others. None of the others. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Properties of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong statements: Recursion is always more efficient than loops. Recursion can make the conceptual design of an algorithm s implementation easier. Recursion gone wrong can lead to overflow stack errors Recursion can be only replaced by iteration. Answer: is always more efficient than loops+ can be only replaced by iteration In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: Answer: Recursion Consider algorithm of the 8-queen problem: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: Right + Left rotation. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices.  
  
Select right statements: Djikstra's shortest path algorithm can be applied to undirected graph. The breadth-first search can be used to find the shortest path from a source ver tex to the destination vertex All of the others. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? Answer: Kruskal + Dijkstra algorithm. Which of the following statements about shortest path finding algorithms are tru e: Dijkstra s algorithm is label-setting algorithm. Dijkstra s algorithm can be applied to graphs have negative weights. The complexity of Dijkstra s algorithm is O(|V|), where |V| is number of vertices of graph. All of the others. Answer: Dijkstra s algorithm is label-setting algorithm. When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: Answer: All of the others. The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution: Answer: Open addressing. Which of the following hashing methods can cause collision: Answer: All of the others. Select incorrect statements: Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword.  
  
Select incorrect statements about Data compression: a Huffman algorithm can be implemented using priority queue. b Huffman algorithm applied to case of the probabilities of symbol are kno wn in advance. c Huffman algorithm can be only applied to text files. d All of the others Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. Answer: True Select incorrect statements about Data compression: a Huffman tree can be only constructed bottom-up. b In adaptive Huffman encoding, sibling property is retained assures the H uffman tree under construction is still a Huffman tree. c All of the others. d None of the others. Answer: Huffman tree can be only constructed bottom-up. Which expressions will evaluate to true if preceded by the following code? (a == "Hello") (a == b) (a == c) a.equals(b) Answer: (a == c)+a.equals(b) What is output when calling TriangularNumber(4) Answer: 10 What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10 Answer: 11 What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? Answer: 5 What is maximum number of elements in queue when traversing the below tree using the above algorithm? Answer: 4 Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop. Answer: {15,12,6,11,10,2,3,1,8} In the first loop, moveDown is called n/2 times in any case. The total number of moves in all executions of moveDown in the second phase is O (lgn). All of the others. None of the others. Answer: In the first loop, moveDown is called n/2 times in any case. this is g of A this is g of C An error occurs when compiling the program.  
  
Nothing is printed. Answer: this is g of C Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. Answer: {3,4,8,10,12,17,5,14,13} How many times is number 840 printed out when call pattern(840) Answer: 2 How many integers will the program print when calling nonTail(n), n > 0. Answer: 2^n -1 Count number of even values in binary tree. Print even numbers in binary tree. Print even numbers in ascending order. Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. Count number of nodes in binary tree. Calculate height of binary tree. Count number of nonterminal nodes in binary tree. None of the others Answer: Calculate height of binary tree. Check whether binary tree is balanced. Check whether height of left subtree is greater than height of right subtree. Check whether height of right subtree is greater than height of left subtree. None of the others. Answer: Check whether binary tree is balanced.  
  
Select incorrect statements about Object Oriented Programming: Static methods and variables are associated with the class it self and are called instance methods and instance variables The combination of data and related operations is called information hiding principle. Answer: Static methods and variables+ The combination of data Which of the following keywords are access modifier: Answer: protected + private Select correct statements: a. A derived class can override the definition of a final method by introducing its own definition t. In an abstract class, methods are only declared but not defined c. Subclasses or derived classes inherit the fields and methods from their base class. d. An abstract data type can be part of a program in the form of an interface Answer: Subclasses or derived classes inherit+ An abstract data type An object can be saved in a file if its class type is stated toimplement the Ser ializable interface, d. If the vector s capacity is greater than its size, then anew element can be inserted at the end of the vector immediately. Answer: An object + If the vector s capacity Which of sentences about singly linked list are true:  
  
Answer: begin O(1)+ average O(n)+ is no immediate a. Methods for processing doubly linked list are simpler than those of singly linked list b. The node which is deleted from the list will be claimed by the garbage collector. c Deleting a node at the end of the list takes constant time 0(1). d. Inserting a new node at the end of the list requires 0 ( n) steps. Answer: The node which is deleted+ Deleting a node at the end Select incorrect statement about skip list: Answer: None of the others. Select incorrect statement about skip list: The search time is O (ign) in the worst case. Answer: search time is O (ign)+20 element Select false statement: Stack can be implemented using linked list. Stack is applied to Java Virtual Machine, In the array list, poping is executed in O (lgn) to the worst case. In the array list, popping is executed in constant time 0(1) Answer: poping is executed in O (lgn) to the worst case. a. The Java implementation of the stack is potentially fatal. b. pop () method returns copy of the top element in the stack c. peek () method removes the top element of the stack and return it. d. Stack can be implemented by linked list. Answer: The Java implementation+ Stack can be implemented by linked list Which of the following can be executed in constant time 0 ( n) Answer: deleting singly linked list average case +worst case. Which of the following statements are true: Local variables must be stored in activation recordt. the return address is address of the caller s instruction immediately foil owing t he c al 1. Answer: all-in the most case When converting a method from a recursive version into an iterative version, Answer: The brevity not be lost + diminished Recursive definitions on most computers are eventually implemented using a run t ime stack and this implementation is done by the operating system. Answer: True In all cases, nonrecursive implementation is faster recursive implementation. Answer: False Which of the following concepts of tree are true: Answer: all -path is number of arcs Select correct statement: A search can takes 1g ( n) time units in the worst case. Answer: all-A search lg ( n)worst case.+ for a binary tree Select incorrect statement: Depth-first traversal can be implemented using stack. Depth-first traversal can not be implemented if not using stack  
  
A recursive implementation of preorder free traversal uses stack p1icitly. There are six possible ordered depth-first traversals. Morris s algorithm does not temporarily change free structure. Answer: all-DF stack+ morris Which of the following statements are true: a. Polish notation eliminates all parentheses from formulas b. Preorder, inorder and posorder tree traversal generate unambiguous outputs. Using Polish notation, all expressions have to be broken down unambiguous into separate operations and put into their proper order d. In a expression tree, leaves are operators and nonterninal nodes are operands. e. Expression trees do not use parentheses. f. Polish notation is only applied for compilers. Answer: parentheses +Using Polish+ Expression Which of the following statements about finding the shortest path are true: a. The complexity of Ford s algorithmis O(VWEh for any graph. t. For label-correcting method, information of any label can be changed during application of method. c. Ford s algorithm relies on label -setting method. t The complexity of Dijkstra s algorithm using heap is O(VlnV) e. The complexity of Dijkstra s algorithm is o( v12) Answer: complexity Dijkstra s +complexity Dijkstra s + label-correcting Which of the following statement about spanning tree is false: a. The complexity of Kruskal s algorithm depends on the complexity of the sorting method applied t. The complexity of Kruskal s algorithm depends on the method used for cycle detection. c. All of the others. t None of the others. Answer: None of the others. Which of the following statements about efficient sorting is false: a. The worst case is when the bound divides an array into subarrays of approximately length b. In quick sort, a strategy for selecting a bound is to choose the element located in the middle of the array. c The best case of quick sort happens when bound is the largest (the smallest) element of the array. d. Quick sort is recursive in nature. Answer: n/2 + best case Which of the following statements is true; a. All the sorting methods implemented in java is applied to any basic data type. t. For objects comparison, a comparison criterion must be implemented by user for all classes. c All of others. t None of others. Answer: All of others. In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case.  
  
Answer: false Which of the following statement are true: Linked list can be used in Bucket Addressing. In chaining, searches always fast if using linked lists. Answer: All-in chaining correct statements a. Extendible hashing is directoryless technique t. Extendible hashing is faster than and requires less space than Linear hashing. c. A reorganization of the file is avoided by using extendible hashing if the directory overflows. The characteristic feature of extendible hashing is the organization of the index, which is expandable table. e. Linear hashing is directory technique. Answer: reorganization + characteristic incorrect statements about Huffman Coding Answer: all-Huffman tree can be built top-down. correct statements about Run-length encoding. Answer: A serious drawback of run-length encoding is that it reliesentirely on the occurrences of runs Identify whether below code has error or not: Answer: Compile error. Identify whether below code has error or not: Answer: 3 Compile error. objectiprocess2 ( N ) calls process2 of class ExtC. object2.processl (1) does not issue compile error. object2.process3 ( N ) call process3 of class C. object3.process2( N ) call process2 of class C. Answer: all-object3.process2( N ) call process2 of class C. Identify which alogrithm the above code implements Insertion Sort Bubble Sort Selection Sort Radix Sort Answer: Insertion Sort Assume that getChar() only reads one character of the input string every it is called. What is output if reverse is executed and input string is ABCDEF\n Answer: FEDCBA What is output if nontail is called with j = 3 Runtime error is issued 1213121 12321 21312 Answer: Runtime error is issued What is output if nontail is called with i = 5 1315131 13531 3135313 None of the others  
  
Answer: 1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: 1211181021563 28 112 11106153 2631581011112 12 1111082 1536 Answer: 2631581011112 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 1211181021563 28 112 11106153 263 15 81011112 121111082 1536 Answer: 2 6 3 15 8 10 1 11 12 What is output if breadthFirst is executed and structure of Binary Tree is the f ollowing image: 2863 15 10112 11 286110153 12 11 268 110 153 1112 2683 15 10 11112 Answer: 2683 15 10 11112 Assume that sort is executed with array {9,4,2,5,8,15,3}. What is output after iteration i=5 of the outer for loop completed Answer: {2,4,5,8,9,10,3) Assume that sort is executed with array {19,14,6,5,18,1,15}. What is output afte r iteration i=5 of the outer for loop completed Answer: { 19, 18, 14,6,5,10, 15) Let deleteFromHead be method used to delete the first element of generic singly linked list class: Identify whether above code has error or not: There are some compile errors. There may be runtime error in some case. There always are runtime errors. No error. Answer: There may be runtime error in some case. Identify whether the code of pop method has error or not: Answer: There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string Â¡s ABCDEF\n t Answer: \nFEDCBA A method within a class is only accessible by classes that are defined within th e same package as the Answer: class of the method. How can such a restriction be enforced? Answer: Do not declare the method with any accessibility modifiers. Which are invalid identifiers?  
  
Answer: zer@ Which statement concerning the switch construct is true? Answer: A character literal can be used as a value for a case label If str denotes a String object with the string "73", which of these expressions will convert the string to the int value 73? Answer: (new Integer(str)).intValue() Select correct statements about a singly linked list. Answer: A node with a specified value (info) can be found by traversing the list . Advantages which linked list have over an array: Answer: Size can be expanded and shrunk rapidly. Which of the following methods take O(n) time for the worst case: Answer: All of the others. Select correct statements about a singly linked list. Answer: Deleting a node at the beginning of a list involves setting head to poin t to head.next. Propertie of a stack is: Answer: Only one item can be accessed at once. Properties of a queue are: Answer: Only one item can be accessed at once. In the array version of the Stack class, which operations require linear time fo r their worst-case behavior? Answer: None of these operations require linear time. In the linked-list version of the Stack class, which operations require linear t ime for their worst-case behavior? Assume that addtoTail, deletefromTail are use d. Answer: pop Select wrong or incorrect statements: Answer: Recursion is always more efficient than loops. In a single method declaration, what is the maximum number of statements that ma y be recursive calls? Answer: There is no fixed maximum The problem of printing an input line in reverse order can be implemented using: Answer: All of the others. Which of the following statements are true: Answer: The algorithm finds all solutions. On average, what is the maximum number of comparisons needed to find a key in a balanced binary search tree with 1 million nodes? Answer: 20 To delete a node in a binary search tree that has two children, the Deletion by Merging method requires to find what node? Answer: The rightmost node of the left subtree of the deleted node. Tree balancing can be performed locally after an element is inserted into or del eted from the tree using . Answer: AVL tree. The DSW Algorithm uses: Answer: All of the others. The depth-first search algorithm for a graph: Answer: Travels all possible paths from a vertex to see if it can find the desti nation before it moves on to the adjacent vertices. Select right or correct statements:Djikstra's shortest path algorithm can be app lied to undirected graph.The breadth-first search can be used to find the shorte st path from a source vertex to the destination vertex. None of the others. Answer: All of the others. Two algorithms which used for finding a minimum spanning tree are Kruskal and Di jkstra. Which algorithm uses the cycle detection method? Answer: All of the others. Which of the following statements about shortest path finding algorithms are tru e: Answer: Dijkstra s algorithm is label-setting algorithm.  
  
When is Insertionsort a good choice for sorting an array? Answer: The array has only a few items out of place. Mergesort makes two recursive calls. Which statement is true after these recursi ve calls finish, but before the merge step? Answer: Elements in each half of the array are sorted amongst themselves. Suppose we are sorting an array of eight integers using a some quadratic (O(n2)) ) sorting algorithm. After four iterations of the algorithm's main loop, the arr ay elements are ordered as shown here: 2 4 5 7 8 1 3 6 Which statement is correct? Answer: The algorithm is not selectionsort, but it might be insertionsort. In Quicksort, the bound value (pivot) is: The first item of array. The middle item of array. The last item of array. Answer: All of the others. The more complex the hashing functions, the better it is Answer: False Which of the following methods are used to collision resolution: Answer: Open addressing. Which of the following hashing methods can cause collision: All of the others. Select incorrect statements: Answer: In quadratic probing the offset from x is the square of the step number, so the probe goes to x, x+1, x+2, x+3, x+4, and so on. Assume that encoding of three symbols X, Y, W, Z is: V: 10 X: 010 Y: 101 W: 100 Z: 110 Which of the following restrictions does this encoding violate: Answer: No codeword is a prefix of another codeword. Select incorrect statements about Data compression: Answer: Huffman algorithm can be only applied to text files. The Huffman algorithm always produces a unique binary tree. Answer: False In an optimal system, there should not be any unused short codewords either a st and-alone encodings or as prefixes for longer codewords. Answer: True Select incorrect statements about Data compression: Answer: Huffman tree can be only constructed bottom-up. Given the following interface definition, which definition is valid? Answer: interface B extends I { void increment (); } Which expressions will evaluate to true if preceded by the following code? Answer: (a == c) ; a.equals(b) Consider the following alogorithm: What is output when calling TriangularNumber( 4) Answer: 10 What is maximum number of activation records (including its caller) in runtime s tack when calling TriangularNumber(10) Answer: 11 What is maximum number of activation records (including its caller) in runtime s tack when traversing the below tree using the above algorithm? Answer: 5 What is maximum number of elements in queue when traversing the below tree using the above algorithm? Answer: 4 Assume array data[] = {2,8,6,1,10,15,3,12,11}. Array data after ending the first loop.  
  
Answer: {15,12,6,11,10,2,3,1,8} Select right or correct statements: Answer: In the first loop, moveDown is called n/2 times in any case. What will be printed when the following program is run? 0 1 An error occurs when compiling the program. Answer: 2 What will be printed when the following program is run? this is g of A An error oc curs when compiling the program. Nothing is printed. Answer: this is g of C Assume array data[] = {4,10,8,3,12,17,5,14,13}. Array data after executing 4 ite rations of outer loop. {3,4,10,8,12,17,5,14,13} {10,8,4,3,12,17,5,14,13} {3,4,5, 8,10,12,13,14,17} Answer: {3,4,8,10,12,17,5,14,13} How many times is number 840 printed out when call pattern(840) Answer: 2 How many integers will the program print when calling nonTail(n), n > 0. Answer: 2n - 1 The above algorithm is used to: Count number of even values in binary tree. Prin t even numbers in binary tree. Print even numbers in ascending order. Print and count number of even values in binary tree. Answer: Print even numbers in binary tree. The above algorithm is used to: Check whether binary tree is balanced. Check whe ther height of left subtree is greater than height of right subtree. Check whet her height of right subtree is greater than height of left subtree. None of the others. Answer: Check whether binary tree is balanced. Which statements are true about inheritance? Answer: In Java the extends clause is used to specify inheritance Which statements are true about interfaces? Answer: Interfaces can extend any number of other interfaces. Which one of these for statements is valid Answer: for (int i=0, j=100; i  
   
In the linked-list version of the Queue, which operations require linear time fo r their worst-case behavior? Answer:None of the others When a method call is executed, which information is not saved in the activation record? Answer:Current depth of recursion. When the compiler compiles your program, how is a recursive call treated differe ntly than a non-recursive method call? Answer:None of the others. Select correct statements about recursion Answer:All of the others. Select the one TRUE statement. Every binary tree is either balanced or perfect b alanced. Every balanced binary tree is also a perfect balanced binary tree. Eve ry perfect balanced binary tree is also a balanced binary tree. No binary tree i s both balanced and perfect balanced. Answer:Every perfect balanced binary tree is also a balanced binary tree. is visiting node starting from the highest (or lowest) level and moving down (or up el by level, visiting nodes on each level from left to right (or from right to l eft). Answer:Breath-First Traversal ..rebalances the tree globally; each and every node could have been involved in rebal ancing either by moving data from nodes or by creasing new values to reference f ields. Answer: The DSW Algorithm A heap is an exellent way to implement a .. Answer: priority queue What is the expected number of operations needed to loop through all the edges t erminating at a particular vertex given an adjacency matrix representation of th e graph? (Assume n vertices are in the graph and m edges terminate at the desire d node). Answer: O(n) What graph traversal algorithm uses a queue to keep track of vertices which need to be processed? Answer: Breadth-first search. Suppose you have a directed graph representing all the flights that an airline f lies. What algorithm might be used to find the best sequence of connections from one city to another? Answer: A shortest-path algorithm. The final exams at a university can be scheduled so that no student has two exam s at the same time by applying Answer:Graph coloring What is the worst-case time for merge sort to sort an array of n elements? Answer: O(nlgn) What is the worst-case time for bublesort to sort an array of n elements? Answer: O(n2) What is the worst-case time for heapsort to sort an array of n elements? Answer: O(nlgn) In a selectionsort of n elements, how many times are the array elements moved in the worst case? Answer: O(n) What is the worst-case time for binary search finding a single item in an array? Answer: Logarithmic time What is the best definition of a collision in a hash table? Answer: Two entries with different keys have the same exact hash value. A chained hash table has an array size of 512. What is the maximum number of ent ries that can be placed in the table? Answer:There is no maximum Suppose you place m items in a hash table with an array size of s. What is the c orrect formula for the load factor? Answer:m/s  
  
Which of the following data structure can be implement Huffman Coding Answer: All of the others Select incorrect statements about restrictions need to be imposed on the prospec tive codes: Answer:Each codeword may corresponds to one or many symbols. Select correct statement about Run-length encoding. Answer:A serious drawback of run-length encoding is that it relies entirely on t he occurrences of runs. Select correct statement about Ziv-Lempel Code. Answer:All of the others. Which statement is true about the following code?Interface1 and Interface2 do no t match, therefore, MyClass cannot implement them both.The declarations of void g() in the two interfaces conflict, therefore, the code will not compile.The dec larations of int VAL\_B in the two interfaces conflict, therefore, the code will not compile.Nothing is wrong with the code, it will compile without errors. Answer:Nothing is wrong with the code, it will compile without errors. What will be the result of attempting to compile and run the following program?T he program will fail to compile. The program will compile without error and prin t 0 when run.The program will compile without error and print 1 when run. The pr ogram will compile without error and print 2 when run. Answer:The program will compile without error and print 2 when run. Which digits, and in which order, will be printed when the following program is run?The program will only print 1 and 4, in that order.The program will only pri nt 1, 4, and 5, in that order.The program will only print 3 and 5, in that order .The program will only print 1, 2, 4, and 5, in that order. Answer:The program will only print 1, 4, and 5, in that order. Consider the following pseudocode:ABABABAB BABABABA ABBAABBA BAABBAAB Answer:ABBAABBA What values of number are directly handled by the stopping case? number < 0 numb er < 10 number >= 0 && number < 10 number > 10 Answer:number >= 0 && number < 10 Number of comparisons of keys and comparisons of i and least is: n(n-1)/2 ; n-1; (n-1)(n+2)/2 ; none of the others Answer: (n-1)(n+2)/2 Assume that this algorithm is executed with array {7,1,2,3,4,5,6}. What is outpu t after iteration i=4 of the outer for loop completed. 1, 2, 3, 4, 5, 6, 7 ; 1, 2, 3, 7, 4, 5, 6 ; 1, 2, 3, 4, 5, 7, 6 ; 1, 2, 3, 4, 7, 5, 6 Answer:1, 2, 3, 4, 5, 7, 6 Number of comparisons of keys is : n(n+1)/2 ; n(n-1)/2 ; n^2; n^2 /2 Answer: n(n-1)/2 Which traversal does the above algorithm implement? Breadth-first traversal Inorder tree traversal Postorder tree traversal Preorder tree traversal Answer: Preorder tree traversal Select correct statements when applying this algorithm to a n-element array: mov eDown() is called n/2 times to create the heap in the first phase. The heap is restored n-1 times in the second phase. In the second phase, this algorithm exchanges n-1 times the root with the elemen t in position.All of the others. Answer: All of the others. How many asterisks are printed by the method call quiz(5)? 8 4 7 None of the others. Answer:7 What is output if this algorithm is executed on the following binary tree: 40 30  
  
7 10 11 3 1 2 14 1 3 2 7 10 40 30 11 14 1 2 3 14 7 10 11 40 30 14 2 1 3 11 10 7 30 40 Answer: 40 30 7 10 11 3 1 2 14 What is output if this algorithm is executed on the following binary tree: a 3 b 9 c 5 d 8 Answer: 5 Which statement, when inserted at the indicated position in the following code, will cause a runtime exception? a x = y; b z = x; c y = (B) x; d z = (C) y; e y = (A) y; Answer: c y = (B) x; Select incorrect statements about Object Oriented Programming: Answer: The combination of data and related operations is called information hid ing principle.Static methods and variables are associated with the class itself and are called instance methods and instance variables. Which of the following keywords are access modifier: Answer:public private Select correct statements: a An abstract data type can be part of a program in the form of an interfa ce. b In an abstract class, methods are only declared but not defined. c Subclasses or derived classes inherit the fields and methods from their base class. d A derived class can override the definition of a final method by introdu cing its own definition. Answer:An abstract data type can be part of a program in the form of an interfac e.; Subclasses or derived classes inherit the fields and methods from their base class. Which of following statements are true: a If the vector s capacity is greater than its size, then a new element can be inserted at the end of the vector immediately. b A vector is a data structure with a uncontiguous block of memory, just l ike an array. c Java use explicit pointers, object access is implemented in terms of poi nters. d An object can be saved in a file if its class type is stated to implemen t the Serializable interface. e Java allow multi inheritance. Answer: If the vector s capacity is greater than its size, then a new element can be inserted at the end of the vector immediately.; An object can be saved in a f ile if its class type is stated to implement the Serializable interface. Which of sentences about singly linked list are true: a Deleting a node at the beginning of the list takes constant time .b Deleting last node of the list always takes time.c On the average, delete o peration executes steps.d Search operation takes time in the best case.e There is no immediate access to the predecessor of any node in list. Answer:Deleting a node at the beginning of the list takes constant time .; On t he average, delete operation executes steps.; There is no immediate access to t he predecessor of any node in list.Select correct statement(s) about Doubly Link ed List: a Deleting a node at the end of the list takes constant time .b Insertin g a new node at the end of the list requires steps.  
  
c The node which is deleted from the list will be claimed by the garbage c ollector. d Methods for processing doubly linked list are simpler than those of sing ly linked list. Answer: Deleting a node at the end of the list takes constant time .; The node which is deleted from the list will be claimed by the garbage collector.Select i ncorrect statement about skip list: Answer: The number of reference fields indicates the level of each node, and the number of levels is maxLevel= + 1Select incorrect statement about skip list: a Searching is efficient. b Insertion and Deletion are very inefficient. c The search time is in the worst case.d maxLevel of skip list which has 20 elements is 5 e In 20-element skip list, the node in position 3 points to the node in po sition 7 Answer: The search time is in the worst case.; In 20-element skip list, the nod e in position 3 points to the node in position 7Select false statement: a Stack is applied to Java Virtual Machine. b Stack can be implemented using linked list. c In the array list, popping is executed in constant time .d In the a rray list, poping is executed in to the worst case. Answer:In the array list, poping is executed in to the worst case. Select true statements about stack: Answer:Stack can be implemented by linked list.; The Java implementation of the stack is potentially fatal. Which of the following methods of queue are true: Put the element el on the top of the queue. a push(el) b isEmpty() Check to see if the queue is empty. c enqueue(el) Put the element el at the end of the queue. d dequeue() Take the last element from the queue. e firstEl() Return the first element in the queue without removing it. lastEl() Return the last element in the queue without removing it. Answer:isEmpty() Check to see if the queue is empty.; enqueue(el) Put the elemen t el at the end of the queue.; firstEl() Return the first element in the queue w ithout removing it. Which of the following can be executed in constant time a when deleting a node of a singly linked list in the worst case. b when deleting a node of a singly linked list in the average case. c when searching is executed in a skip list in the ideal situation. d when insertion sort is executed in the worst case. Answer: when deleting a node of a singly linked list in the worst case.; when de leting a node of a singly linked list in the average case. Recursive definitions on most computers are eventually implemented using a run-t ime stack and this implementation is done by the operating system. Answer:True Which of the following statements are true: a Local variables must be stored in activation record. b The recursive version increases program readability, improves self-docum entation and simplifies coding. c The return address is address of the caller s instruction immediately foll owing the call. d In the most cases, the code of nonrecursive implementation is shorter th an it is in the recursive implementation. Answer:The recursive version increases program readability, improves self-docume ntation and simplifies coding.; The return address is address of the caller s inst ruction immediately following the call. In all cases, nonrecursive implementation is faster recursive implementation. Answer:False When converting a method from a recursive version into an iterative version, Answer:Program clarity can be diminished.; The brevity of program formulation lo  
  
st.However, the brevity may not be an issue in Java. Which of the following concepts of tree are true: Answer:The level of a node is the length of the path from the root to the node p lus 1;The height of a nonempty tree is the maximum level of a node in the tree;T he level of a node must be between 1 and height of the tree. Select correct statement: a Breath-First traversal is implemented using queue. b For a binary tree with n nodes, there are n! different traversals. c The complexity of searching a node is the length of the path leading to this node. d A search can takes time units in the worst case.e The complexity o f searching depends on the shape of the tree and the position of the node in the tree. Answer:Breath-First traversal is implemented using queue;For a binary tree with n nodes, there are n! different traversals;The complexity of searching depends o n the shape of the tree and the position of the node in the tree. Select incorrect statement: a There are six possible ordered depth-first traversals. b Depth-first traversal can be implemented using stack. c Depth-first traversal can not be implemented if not using stack. d A recursive implementation of preorder tree traversal uses stack explici tly. e Morris s algorithm does not temporarily change tree structure. Answer:Depth-first traversal can not be implemented if not using stack;A recursi ve implementation of preorder tree traversal uses stack explicitly;Morris s algori thm does not temporarily change tree structure. Which of the following statements are true: a Polish notation eliminates all parentheses from formulas. b Preorder, inorder and postorder tree traversal generate unambiguous outp uts. c Polish notation is only applied for compilers. d Using Polish notation, all expressions have to be broken down unambiguou s into separate operations and put into their proper order. e In a expression tree, leaves are operators and nonterminal nodes are ope rands and. f Expression trees do not use parentheses. Answer:Polish notation eliminates all parentheses from formulas;Using Polish not ation, all expressions have to be broken down unambiguous into separate operatio ns and put into their proper order;Expression trees do not use parentheses. Which of the following sentences are true: a The complexity of DFS is O(|V|+|E|), where |V|is number of vertices and |E|is number of edges.b The complexity of DFS is (O|V|^2)c All algorithms a re more efficient if the underlying graph traversal is not BFS but DFS. d To prevent loop from happen in an algorithm for traversing a graph, each visited vertex can be marked. Answer:The complexity of DFS is O(|V|+|E|) , where |V| is number of vertices and |E| is number of edges;The complexity of DFS is (O|V|^2) Which of the following statements about finding the shortest path are true: a For label-correcting method, information of any label can be changed dur ing application of method. b The complexity of Dijkstra s algorithm is 0(|V|^2)c The complexity o f Dijkstra s algorithm using heap is 0(|V|ln|V|)d Ford s algorithm relies on label-s etting method. e The complexity of Ford s algorithm is 0(|V||E|) for any graph. Answer:For label-correcting method, information of any label can be changed duri ng application of method;The complexity of Dijkstra s algorithm using heap is 0(|V |ln|V|) Which of the following statement about spanning tree is false: a The complexity of Kruskal s algorithm depends on the complexity of the sor ting method applied.  
  
b  
  
The complexity of Kruskal s algorithm depends on the method used for cycle detection. c All of the others. d None of the others. Answer:None of the others. Which of the following statements about graph coloring is true: a The complexity of sequential Coloring algorithm is 0(|V|^2).b Sequenti al Coloring algorithm establishes the sequence of vertices and a sequence of col or before coloring them. c In sequential coloring algorithm, vertices must be ordered according to indices already to the vertices. d In sequential coloring algorithm, vertices must be ordered according to degree of vertices. Answer:The complexity of sequential Coloring algorithm is 0(|V|^2);Sequential Co loring algorithm establishes the sequence of vertices and a sequence of color be fore coloring them. In Insertion Sort, the number of movements and comparisons for a randomly ordere d array is closer to the best case. Answer:False. Which of the following statements about efficient sorting is false: a Shell sort divides the original array into physical subarrays, sorting t hem separately, then merging and dividing them again to sort the new subarrays u ntil the whole array is sorted. b Only insertion sort is apllied in all h-sorts of shell sort. c There is no formal proof indicating which sequence of increments is opti mal. d Shell sort is more efficient than insertion sort even if in case there a re only two increments. Answer:Shell sort divides the original array into physical subarrays, sorting th em separately, then merging and dividing them again to sort the new subarrays un til the whole array is sorted.;Only insertion sort is apllied in all h-sorts of shell sort. Which of the following statements about efficient sorting is false: a Quick sort is recursive in nature. b A strategy for selecting a bound is to choose the element located in the middle of the array. c The best case of quick sort happens when bound is the largest (the small est) element of the array. d The worst case is when the bound divides an array into subarrays of appr oximately length n/2.Answer:The best case of quick sort happens when bound is th e largest (the smallest) element of the array; The worst case is when the bound divides an array into subarrays of approximately length n/2 Which of the following statements is true: All the sorting methods implemented in java is applied to any basic data type. For objects comparison, a comparison criterion must be implemented by user for a ll classes. All of others. None of others. Answer:None of others. Which of the following statement about Open Addressing are false: Answer:In linear probing of the open addressing method, the position in which ke y can be stored is found by sequentially searching starting from the begin of ta ble;Using quadratic probing gives much better results than linear probing and av oids the problem of cluster buildup. Which of the following statement are true: a Coalesced hashing combines linear probing with chaning. b In chaining, searches always fast if using linked lists. c Self-organizing linked lists can be used to improve performance in chain ing. d Linked list can be used in Bucket Addressing.  
  
Answer:Coalesced hashing combines linear probing with chaning;Linked list can be used in Bucket Addressing. Which of the following statement about Perfect Hash Functions are true: Answer:Cichelli s method is used to hash relatively small number of reserved words ;Cichelli s method uses an exhaustive search. Select correct statements: a Extendible hashing is directoryless technique. b Linear hashing is directory technique. c The characteristic feature of extendible hashing is the organization of the index, which is expandable table. d A reorganization of the file is avoided by using extendible hashing if t he directory overflows. e Extendible hashing is faster than and requires less space than Linear ha shing. Answer:The characteristic feature of extendible hashing is the organization of t he index, which is expandable table; A reorganization of the file is avoided by using extendible hashing if the directory overflows. Which of the following data structure can be implement Huffman Coding Answer:Singly linked list;Priority queue;Doubly linked list. Select incorrect statements about Huffman Coding: Answer:Huffman tree is only implemented by non-recursive algorithm;Adaptive Huff man coding uses breath-first left-to-right tree traversal generates a list of no des with nonincreasing frequency counter. Identify whether below code has error or not: a Compile error. b Runtime error. c No error. Answer:Compile error. Identify whether below code has error or not: a Runtime error. b 3 compile errors. c No error. d 2 compile errors Answer:3 compile errors. Which of the following statements are true a object2.process1 (1) does not issue compile error. b object1.process2 ( N ) calls process2 of class ExtC. c object3.process2( N ) call process2 of class C. d object2.process3 ( N ) call process3 of class C. Answer:object1.process2 ( N ) calls process2 of class ExtC;object2.process3 ( N ) call p rocess3 of class C. Identify which alogrithm the above code implements a Selection Sort b Insertion Sort c Bubble Sort d Radix Sort Answer:Insertion Sort Identify which alogrithm the above code implements a Heap sort b Bubble sort c Quick sort d Radix Sort Answer:Bubble sort Assume that getChar() only reads one character of the input string every it is c alled. What is output if reverse is executed and input string is ABCDEF\n a ABCDEF b CBADEF c FEDCBA d DEFCBA Answer:FEDCBA  
  
What is output if nontail is called with i = 3 a 12321 b 1213121 c 21312 d Runtime error is issued. Answer:Runtime error is issued. What is output if nontail is called with i = 5 a 1315131 b 13531 c 3135313 d None of the others Answer:1315131 What is output if preorderVRL is executed and structure of Binary Tree is the fo llowing image: a 2 6 3 15 8 10 1 11 12 b 2 8 1 12 11 10 6 15 3 c 12 1 11 8 10 2 15 6 3 d 12 11 1 10 8 2 15 3 6 Answer:2 6 3 15 8 10 1 11 12 Assume that sort is executed with array {9,4,2,5,8,10,3}. What is output after i teration i=4 of the outer for loop completed a {2,4,5,8,9,10,3} b {2,4,5,9,8,10,3} c {9,8,5,4,2,10,3} d {2,3, 4,5,8,9,10} Answer:{2,4,5,8,9,10,3} Assume that sort is executed with array {19,14,6,5,18,10,15}. What is output aft er iteration i=4 of the outer for loop completed a {19,18,14,6,5,10,15} b {5,6,14,18,19,10,15} c {5,6,10,14,15,18,19} d {19,18,15,14,10,6,5} Answer:{19,18,14,6,5,10,15} Let deleteFromHead be method used to delete the first element of generic singly linked list class:Identify whether above code has error or not: a No error. b There may be runtime error in some case. c There are some compile errors. d There always are runtime errors. Answer:There may be runtime error in some case. Identify whether the code of pop method has error or not: a No error. b There may be runtime error in some case. c There are some compile errors. d There always are runtime errors. Answer:There may be runtime error in some case. Assume that getChar() only reads one character of the input string every it is c alled.