

Multiple choices 1/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D  
☐ E

Next

(Choose 1 answer)

Suppose a doubly linked list of integers is given below and  $p$  is a reference to the node with value 15 in the list (i.e.  $p.info=15$ ):  
(head) 7 11 6 4 3 15 8 12 (tail)  
What does the list look like after the following java code snippet is run?  
`int x = 35;  
Node f = p.prev; // prev is a link to predecessor node  
Node q = new Node(x); // Create new node with value x  
q.prev = f; q.next = p;  
f.next = q; p.prev = q;`

- A. 7 11 6 4 3 35 15 8 12  
B. 35 7 11 6 4 3 15 8 12  
C. 7 11 6 4 3 15 8 12 35  
D. 7 11 6 4 3 15 8 35 12  
E. 7 11 6 4 3 15 35 8 12

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 2/50

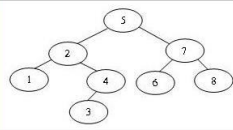
Answer

- ☐ A  
☐ B  
☐ C  
☐ D

Next

(Choose 1 answer)

What is the breadth-first traversal of a tree below after deleting the node 5 by merging?



- A. 4, 2, 7, 1, 3, 6, 8  
B. 2, 1, 4, 3, 7, 8, 6  
C. 2, 1, 4, 3, 7, 6, 8  
D. 2, 1, 4, 3, 6, 7, 8

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 3/50

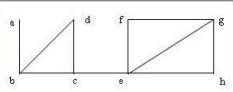
Answer

- ☐ A  
☐ B  
☐ C  
☐ D

Next

(Choose 1 answer)

Consider a graph below. One cut-edge in the graph is



- A. (b, c)  
B. (b, d)  
C. (f, g)  
D. (c, e)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 4/50

Answer

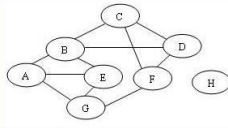
(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

What is the breadth-first traversal from the vertex F of a graph below? (visit nodes in ABC order if there are some nodes having the same selection ability)

- A. F, C, D, G, B, A, E, H  
B. F, C, B, D, G, A, E, H  
C. F, C, D, G, B, A, E  
D. F, C, D, G, A, B, E, H

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 5/50

Answer

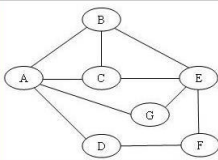
(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D  
☐ E

Given a graph below and colors numbered 1, 2, 3, ... are assigned to vertices with the sequential coloring algorithm that orders vertices in decreasing order of their degrees. (i.e. vertices are put in the largest first sequence) What is the color of the vertex D?

- A. 3  
B. 2  
C. 1  
D. 5  
E. 4

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 6/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Specify the correct statement about chaining method for handling collision

- A. In chaining, some positions of the table is associated with a linked list or chain of structures whose info fields store keys or references to keys  
B. In this method, the table can never overflow if free memory is available, because the linked list is extendible.  
C. In chaining, the linked-list is used instead of array for a hash table  
D. None of others

Next

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 7/50

Answer

(Choose 1 answer)

- ☐ A
- ☐ B

Next

In a linked list, the tail node is introduced for performance purpose only.

- A. False
- B. True

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

## Multiple choices 8/50

Answer

(Choose 1 answer)

- ☐ A Given the division hash function  $h(x) = x \% M$ , where  $M = 10$  and Collision Resolution is linear probing. How the hash table looks like after inserting the following keys sequentially? 95, 33, 221, 204, 53, 243
- ☐ B
- ☐ C
- ☐ D

Next

- A. (2)
- B. (3)
- C. (4)
- D. (1)

0		0		0		0	
1	221	1	221	1	221	1	221
2		2		2		2	
3	33	3	33	3	33	3	33
4	204	4	204	4	204	4	204
5	95	5	95	5	95	5	95
6		6		6	243	6	53
7		7		7	53	7	243
8	243	8	53	8		8	
9	53	9	243	9		9	
(1)		(2)		(3)		(4)	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

## Multiple choices 9/50

Answer

(Choose 1 answer)

- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Consider the following pseudocode:

```
declare a stack of characters
while(there are more characters in the word to read)
{
  read a character
  if a character is "" then
    pop the stack
  else
    push the character into the stack
}
while(the stack is not empty)
  pop and write the popped character to the screen
```

What is written to the screen for the input "Good\*\*Mor\*ni\*\*\*ng" ?

A. gnMoG

B. gnMoo

C. gnoMo

D. GoMng

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 10/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

Next

Which of the following queue operations could result in queue underflow (become empty)?

A. isEmpty

B. dequeue

C. enqueue

123456789101112131415161718192021222324252627282930313233343536373839404142

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Finish

Exit

Multiple choices 11/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

☐ D

Next

Fill in the blank of the statement to form the most correct one:  
In a \_\_\_\_\_ every element contains some data and a link to the next element, which allows to keep the structure.

A. binary search tree

B. doubly linked list

C. singly linked list

D. skip list

123456789101112131415161718192021222324252627282930313233343536373839404142

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Finish

Exit

Multiple choices 12/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

☐ D

Next

Select the statement that is most correct.  
Basically, the complexity of finding the position of the minimum value in a doubly-linked list of integer numbers is

A.  $O(1)$

B.  $O(n)$

C.  $O(\log n)$

D.  $O(n^2)$

123456789101112131415161718192021222324252627282930313233343536373839404142

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Finish

Exit

Multiple choices 13/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Consider the following function:

```
void fun(int n)
{
    if (n == 0)
        System.out.println("That's all!");
    else
        for(int i = 1; i <= n; i++)
            System.out.println(i);
            System.out.println( );
            fun(n - 1);
}
```

What is the output when the statement fun(3) is run?

- A. That's all!  
\*\*\*  
\*\*  
\*  
\*  
B. That's all!  
\*  
\*\*  
\*\*\*  
C. \*\*\*  
\*\*  
\*  
That's all!  
D. \*  
\*\*  
\*\*\*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 14/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

The minimum number of edges required to create a cyclid graph (the graph containing a cycle) of  $n$  vertices is

- A.  $N$   
B.  $n-1$   
C.  $n+1$   
D.  $2n$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 15/50

Answer

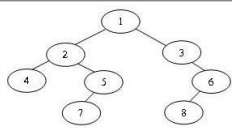
(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Given a binary tree below. What is a result of in-order traverse?

- A. 4, 2, 5, 7, 1, 8, 6, 3  
B. 4, 2, 7, 5, 1, 3, 8, 6  
C. 4, 7, 5, 2, 8, 6, 3, 1  
D. 4, 2, 7, 5, 1, 8, 6, 3

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 16/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Select the statement that is most correct.  
Suppose we are considering a doubly linked list and  $p$  is some node in the list which has predecessor node.  
What does the java code snippet below do?  
Node  $f = p.prev$ ; //  $prev$  is a link to predecessor node  
Node  $q = new Node(x)$ ;  
 $q.prev = f$ ;  $q.next = p$ ;  
 $f.next = q$ ;  $p.prev = q$ ;

- A. It inserts new node with value  $x$  before the node  $p$ .  
B. It inserts new node with value  $x$  after the node  $p$ .  
C. It replaces the node  $p$  with new node with value  $x$ .  
D. It creates new node with value  $x$  at the end of the list.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

## Multiple choices 17/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C

Next

Suppose we are considering a binary search tree.  
Select the most correct java code snippet  
that search a node with value  $x$ .

- A. Node search(int  $x$ )  
{  
Node  $p = root$ ;  
while( $p.info != x$  &&  $p != null$ )  
{  
if( $x < p.info$ )  $p = p.left$ ;  
else  $p = p.right$ ;  
}  
return( $p$ );  
}  
}
- B. Node search(int  $x$ )  
{  
Node  $p = root$ ;  
while( $p.info != x$ )  
{  
if( $x < p.info$ )  $p = p.left$ ;  
else  $p = p.right$ ;  
}  
return( $p$ );  
}  
}
- C. Node search(int  $x$ )  
{  
Node  $p = root$ ;  
while( $p != null$  &&  $p.info != x$ )  
{  
if( $x < p.info$ )  $p = p.left$ ;  
else  $p = p.right$ ;  
}  
return( $p$ );  
}  
}

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

## Multiple choices 18/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Consider the following function:  
void fun(int  $n$ )  
{  
if( $n > 0$ )  
{  
fun( $n-2$ );  
System.out.print(" " +  $n$ );  
}  
}  
What is the output when the statement fun(9); is run?

- A. 1 3 5 7 9  
B. 9 7 5 3  
C. 9 7 5 3 1  
D. 7 5 3 1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 19/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

☐ D

Next

Select the statement about recursive function, that is most correct.

A. Every recursive function must have exactly one base case.

B. Every recursive function must have at least one base case.

C. In recursive function the base cases may be absent.

D. In recursive function only the general (recursive) case must be appeared.

123456789101112131415161718192021222324252627282930313233343536373839404142

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Finish

Exit

Multiple choices 19/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

☐ D

Next

Select the statement about recursive function, that is most correct.

A. Every recursive function must have exactly one base case.

B. Every recursive function must have at least one base case.

C. In recursive function the base cases may be absent.

D. In recursive function only the general (recursive) case must be appeared.

123456789101112131415161718192021222324252627282930313233343536373839404142

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☐ I want to finish the exam.

Finish

Exit

Multiple choices 21/50

Answer

(Choose 1 answer)

☐ A

☐ B

☐ C

☐ D

☐ E

Next

Suppose a doubly linked list of integers is given below and p is a reference to the node with value 29 in the list (i.e. p.info=29).  
(head) 17 11 6 4 3 29 8 2 (tail)  
What does the list look like after the following java code snippet is run?  
int x = 5;  
Node p1, p2;  
p1 = new Node(x);  
p2 = p.next;  
p.next = p1; p1.prev = p;  
p1.next = p2; p2.prev = p1;

A. 17 11 6 4 3 29 8 2 5

B. 17 11 6 4 3 5 29 8 2

C. 17 11 6 4 3 29 5 8 2

D. 17 5 11 6 4 3 29 8 2

E. 5 17 11 6 4 3 29 8 2

123456789101112131415161718192021222324252627282930313233343536373839404142

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Finish

Exit

Multiple choices 22/50

Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Suppose you are using the LZW algorithm to encode the message AABCAAAABD contents of the dictionary at the beginning of encoding are:  
(1) A (2) B (3) C (4) D

What string is denoted by code word (7)?

- A. CA
- B. BC
- C. BCA
- D. CAA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 23/50

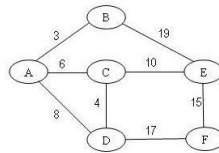
Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E

Next

Given a weighted graph below.  
What is the total edge-weight of the minimum spanning tree of G?

- A. 38
- B. 26
- C. 24
- D. 18
- E. 40



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 24/50

Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Consider the following pseudocode:  
declare a queue of characters  
while(there are more characters in the word to read)  
{  
  read a character  
  if a character is "" then  
    dequeue and write the dequeued character to the screen  
  else  
    enqueue the character into the queue  
  }  
}

What is written to the screen for the input "HowAre\*\*\*You\*\*To\*\*\*\*Day" ?

- A. owAreYouT
- B. HowAreYo
- C. HowAreYou
- D. wAreYouTo

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit



Multiple choices 25/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

(Choose 1 answer)

Consider the following pseudocode:  
declare a queue of characters,  
which is implemented by circular  
array of size 6.  
while (there are more characters  
in the word to read)  
{read a character  
if a character is '\*' then  
dequeue the queue  
else  
enqueue the character into the  
queue  
}  
How the queue looks like after  
processing the input  
"Hello\*\*Wor\*\*ld\*\*"?

- A. (1)  
B. (2)  
C. (3)  
D. (4)

(1)	0	1	2	3	4	5
	d			o	r	l
(2)	0	1	2	3	4	5
	o	r	l	d		
(3)	0	1	2	3	4	5
	r	l	d			o
(4)	0	1	2	3	4	5
		o	r	l	d	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

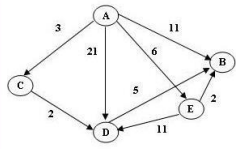
Multiple choices 26/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

(Choose 1 answer)

Given a weighted graph below  
and you are using the Dijkstra  
algorithm to find the shortest  
path from the vertex A to the  
vertex B. What are the correct  
order of vertices selected into  
the set S until the vertex B is  
selected? (Each step a vertex  
with minimal current distance is  
selected into S).



- A. A, C, D, B  
B. A, C, D, E, B  
C. A, C, E, B  
D. A, C, B

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

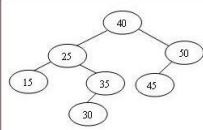
Multiple choices 27/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

(Choose 1 answer)

What is the breadth-first traversal  
of a tree below after deleting the  
node 40 by copying?



- A. 25, 15, 50, 35, 30, 45  
B. 35, 25, 50, 15, 30, 45  
C. 25, 15, 35, 50, 30, 45  
D. 35, 15, 25, 30, 45, 50

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 28/50

Answer

- ☐ A  
☐ B

Next

(Choose 1 answer)

Select the statement that is most correct.  
Suppose we are considering a doubly linked list which is not empty. What does the java code snippet below do?  
Node q = new Node(x);  
q.prev=null;  
q.next = head;  
head.prev = q;  
head = q;

- A. It inserts new node with value x after the head of the list.  
B. It inserts new node with value x at the head of the list.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 29/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

Next

(Choose 1 answer)

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

The height of a complete binary tree with n nodes is  
1.  $n \log n$   
2.  $n \log_2(n+1)$   
3.  $\log_2(n)$   
4.  $\log_2(n+1)$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 29/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

Next

(Choose 1 answer)

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

The height of a complete binary tree with n nodes is  
1.  $n \log n$   
2.  $n \log_2(n+1)$   
3.  $\log_2(n)$   
4.  $\log_2(n+1)$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 30/50

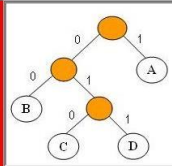
Answer

- ☐ A  
☐ B  
☐ C  
☐ D

(Choose 1 answer)  
Using the Huffman code tree below. What is the result of decoding the string: 1000010011?

- A. ABBCD  
B. ABCBD  
C. ABCDB  
D. ABBDC

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

☐ I want to finish the exam.

Finish

Exit

Multiple choices 31/50

Answer

- ☐ A  
☐ B

(Choose 1 answer)

Run length encoding is a lossless compression method in which repeated occurrences of a symbol are replaced by one occurrence of the symbol followed by the number of occurrences.

- A. True  
B. False

Next

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 32/50

Answer

- ☐ A  
☐ B  
☐ C  
☐ D

(Choose 1 answer)

What is the result of the breadth first traverse of the binary search tree T, after inserting the following keys into the tree sequentially (suppose T is empty before insertion): 19, 11, 6, 4, 15, 23, 20

- A. 19, 11, 23, 6, 3, 15, 20  
B. 19, 11, 23, 6, 15, 4, 20  
C. 19, 11, 23, 6, 15, 20, 4  
D. 19, 11, 23, 6, 20, 4, 15

Next

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Exit

## Multiple choices 33/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Consider the fun() method in a singly linked list below:

```
void fun()
{
    if (isEmpty()) return;
    if (head == tail)
        head = tail = null;
    else
        (Node p1,p; p1=null;p=head;
         while(p!=tail) {p1=p;p=p.next;}
         p1.next=null; tail=p1;
        )
}
```

Specify the correct statement about the fun() method in the code above (choose the most suitable one).

- A. It removes a node at the middle of the list  
B. It removes a node at the beginning of the list  
C. It removes a node at the end of the list  
D. The code does not change the list.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Exit

## Multiple choices 34/50

Answer

(Choose 2 answers)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Which statements are true (select two):

- A. In a singly-linked list there is no efficient way to insert a node before a given node in the middle of the list (the action is considered efficient if it's complexity is  $O(1)$ ).  
B. In a singly-linked list we can insert a node after a given node with time complexity  $O(1)$   
C. In a singly-linked list we can insert a node after a given node with time complexity  $O(n)$   
D. In a singly-linked list we can insert a node before a given node in the middle of the list with time complexity  $O(1)$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 35/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

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

- A. enqueue  
B. append  
C. insert  
D. add

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 36/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Specify the correct statement about bucket addressing method for handling collision (select the best answer).

- A. Bucket is a linked list which holds items in the hash table.  
B. A bucket is a block of space which is large enough to store all colliding items.  
C. Colliding elements in the same position in the hash table are placed on a bucket associated with that position.  
D. All of the statements are incorrect.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 37/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

The function  $f(n)$  is defined as below:

1. if  $n=1$  or  $n=2$  then  
 $f(n) = 1$ ;  
2. if  $n > 2$  then  
 $f(n) = f(n-1) + 2f(n-2)$   
What is the value of  $f(5)$  ?

- A. 12  
B. 11  
C. 13  
D. 10

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

## Multiple choices 38/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Next

Select the most correct statement about the complexity of selection sort

- A. Both best and worst cases are  $O(n^2)$   
B. The best case is  $O(n)$ , and the worst case is  $O(n^2)$   
C. The best case is  $O(n)$ , and the average case is  $O(n \log n)$   
D. The best case is  $O(n)$ , and the average case is  $O(n^2)$

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 39/50

Answer

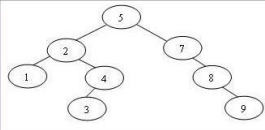
(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Given a binary search tree T below. What is a result of breadth-first traverse of T after you delete by copying the root (node 5)?

- A. 4, 2, 7, 1, 8, 3, 9  
B. 4, 2, 7, 1, 3, 8, 9  
C. 2, 1, 4, 3, 7, 8, 9  
D. 2, 1, 4, 7, 8, 3, 9

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 40/50

Answer

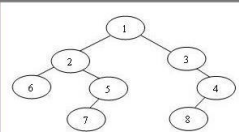
(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

Given a binary tree below. What is a result of pre-order traverse?

- A. 1, 2, 6, 5, 7, 3, 4, 8  
B. 1, 2, 6, 5, 7, 3, 8, 4  
C. 1, 2, 6, 7, 5, 3, 4, 8  
D. 6, 2, 7, 5, 1, 8, 4, 3

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 41/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D

The complexity of heap sort is

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

Next

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 44/50

Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Consider the following pseudocode:  
 declare a stack of characters  
 while(there are more characters in the word to read)  
 (read a character  
 if a character is "" then  
 pop and write the popped character to the screen  
 else  
 push the character into the stack  
 )  
 What is written to the screen for the input "Go\*odMorn\*in\*\*g" ?

A. oGnmid  
 B. oGnniM  
 C. oGnnio  
 D. oGnrndo

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 45/50

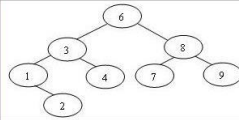
Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Given a binary search tree T below. What is a result of breadth-first traverse of T after you delete by merging the node 3?

A. 6, 1, 8, 2, 4, 7, 9  
 B. 6, 2, 1, 4, 8, 7, 9  
 C. 6, 2, 8, 1, 4, 7, 9  
 D. 6, 1, 8, 2, 7, 9, 4



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 46/50

Answer

- (Choose 1 answer)
- ☐ A
- ☐ B
- ☐ C
- ☐ D

Next

Select the correct statement.  
 Suppose T is a binary tree with 14 nodes. What is the minimum possible height of T?  
 (Note: in a tree the height of root is 1)

A. 2  
 B. 4  
 C. 3  
 D. 5

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

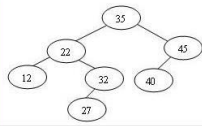
Multiple choices 47/50

Answer

(Choose 1 answer)

- ☐ A Consider the AVL tree below. What is the breadth first traversal of the tree after inserting a node with value 24?
- ☐ B
- ☐ C
- ☐ D
- A. 35, 22, 45, 12, 40, 27, 24, 32
- B. 35, 22, 45, 12, 27, 40, 24, 32
- C. 35, 22, 45, 12, 32, 40, 27, 24
- D. 35, 22, 45, 12, 32, 40, 24, 27

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

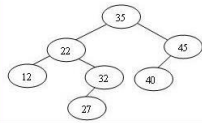
Multiple choices 47/50

Answer

(Choose 1 answer)

- ☐ A Consider the AVL tree below. What is the breadth first traversal of the tree after inserting a node with value 24?
- ☐ B
- ☐ C
- ☐ D
- A. 35, 22, 45, 12, 40, 27, 24, 32
- B. 35, 22, 45, 12, 27, 40, 24, 32
- C. 35, 22, 45, 12, 32, 40, 27, 24
- D. 35, 22, 45, 12, 32, 40, 24, 27

Next



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 49/50

Answer

(Choose 1 answer)

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- A. 3B4U4B3U2B5UU2
- B. 3B4U3B2U5B
- C. 3B4U3B2U5B2U
- D. 3B4U3B2U5B2UU

Next

Given a raw message 'BBBBUUUBBBUUBBBBBUU' (without single quote). Run the run-length encoding algorithm for that message, what is the output?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit



Multiple choices 48/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B  
☐ C  
☐ D  
☐ E

Next

Consider the following function:

```
int fun(int n)
{
    if (n < 0)
        return(fun(-n));
    else if (n < 5)
        return(2);
    else
        return(n*fun(n/2));
}
```

Which call will result in the most recursive calls?

- A. fun(1014);  
B. fun(100);  
C. fun(0);  
D. fun(1012);  
E. fun(-1012);

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

Exit

Multiple choices 50/50

Answer

(Choose 1 answer)

- ☐ A  
☐ B

Next

Select the statement that is most correct.

- A. Tail recursion is a special case of recursion in which the first operation of the function, is a recursive call.  
B. Tail recursion is a special case of recursion in which the last operation of the function, the tail call, is a recursive call.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

43 44 45 46 47 48 49 50

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Finish

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