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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, July 2020

Course Code & Name: CSEG1004 – Advanced Data Structures Semester: II

Programme: B.Tech. CSE (BIG DATA)

			Question Settin
			Question Settin
ou can edit, delete o graded after you su		nt values of test questions on this page. If necessary, ts.	est attempts will be
Description	All questions a	are compulsory	
	No Negative M	<i>f</i> larking	
	No. of Questio	ons :60	
	Maximum Tim	e 2 hours	
	i.	Do not access any other website except learn.u	pes.ac.in
	ii.	During exam students will not be allowed to leave	
	iii.		e the room.
		Mobile phones are not allowed during exam.	
	iv.	Don't click on submit button during exam if not fini	ished.
Instructions			
Total Questions Total Points	400		
Number of Attemp	100 ots 23		
Select: All No		ts Update and Regrade Hide Question	Details

Question	CO1:What is the output of the following code	
	char symbol[3]={'a','b','c'};	
	for (int index=0; index<3; index++)	
	cout << symbol [index];	
Answer	abc	
	"abc"	
	abc	
	'abc'	

☐ 2. Multiple Choice: CO1:If the variable count exceeds 100...

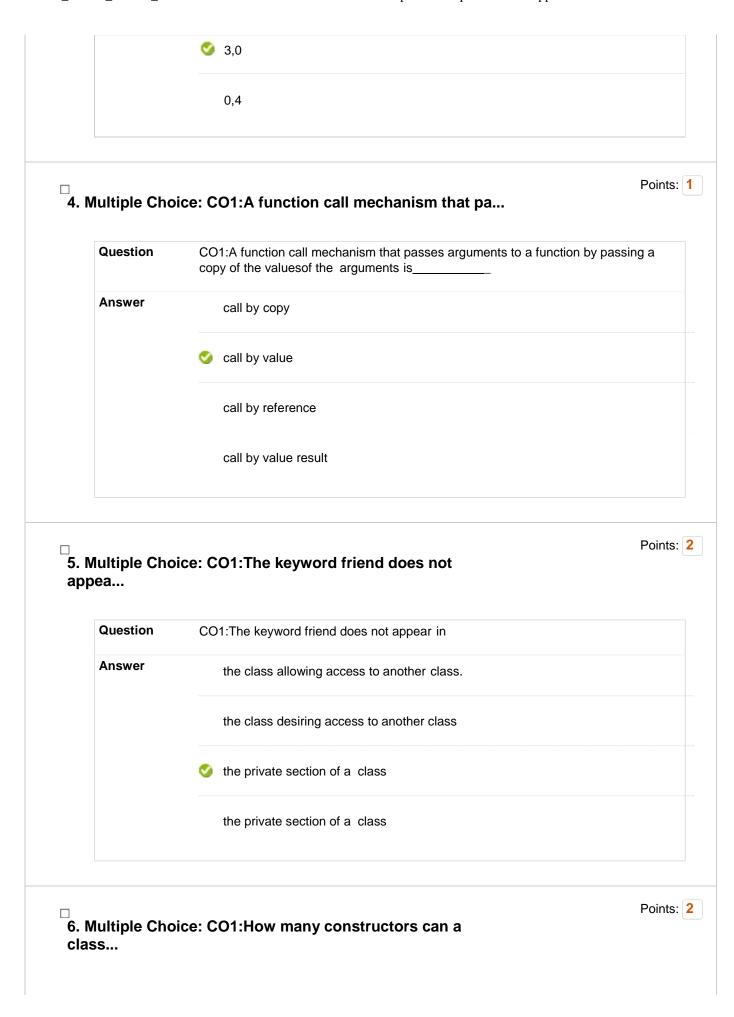
Points: 2

Question	CO1:If the variable count exceeds 100, a single statement that prints "Too many" is
Answer	if (count<100) cout << "Too many";
	if (count>100) cout >> "Too many";
	if (count>100) cout << "Too many";
	None
	None

 $\hfill\Box$ 3. Multiple Choice: CO1:If an array is declared as int a[...

Points: 2

Question	CO1:If an array is declared as int a[4] = {3, 0, 1, 2}, then values assigned to a[0] & a[4] will be
Answer	3,2
	0,2



Question	CO1:How many constructors can a class have?
Answer	0
	1
	2
	un-limited

□ 7. Multiple Choice: CO1:What would be the output of the f...

Points: 2

Points: 1

```
Question

CO1:What would be the output of the following?

#include<iostream.h>

void main()

{
    char *ptr="abcd";
    char ch;
    ch = ++*ptr++;
    cout<<ch;
}

Answer

a

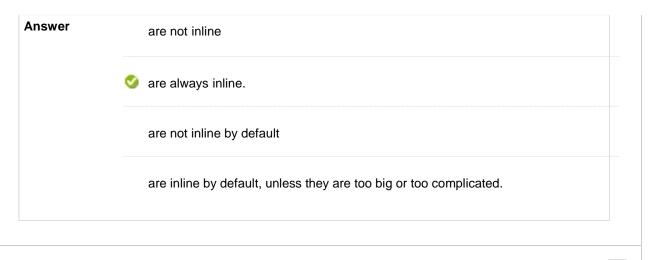
ob

both
error
```

8. Multiple Choice: CO1:Member functions, when defined wi...

Question CO1:Member functions, when defined within the class specification:

Points: 2



 $\hfill \square$ 9. Multiple Choice: CO1:What is wrong with the following ...

```
CO1:What is wrong with the following program int main()
{
    const double PI;
    int n;
    PI = 3.14159265358979;
    n = 22;
}

Answer

double can not be followed const

    const is un identified

PI must be initialized at the time of declaration

error
```

10. Multiple Choice: CO1:How many times is the copy constr...

```
Question
                 CO1:How many times is the copy constructor called in the following code?
                 class copy_const{
                                      };
                 copy_const f(copy_const u)
                 copy_const v(u);
                 copy\_const w = v;
                 return w;
                 int main ()
                 copy_const x;
                 copy\_const y = f (f (x));
                 }
Answer
                     2
                     1
                 copy constructor is not called
                     3
```

☐ 11. Multiple Choice: CO1: #include<iostream.h> voi...

Points: 1

```
Question CO1:

#include<iostream.h>
void main()
{

int i, j, m;

int a[5]={8, 10, 1, 14, 16};

i = ++a[2];

m = a[i++];

cout <<ii>cout <<ii>m;
}

Answer

② 3 2

2 2

3 1

2 1
```

$\hfill\square$ 12. Multiple Choice: CO2:If a class C is derived from clas...

Question

CO2:If a class C is derived from class B, which is derived from class A, all through publicinheritance, then a class C member function can access

Answer

protected and public data only in C and B

protected and public data only in C

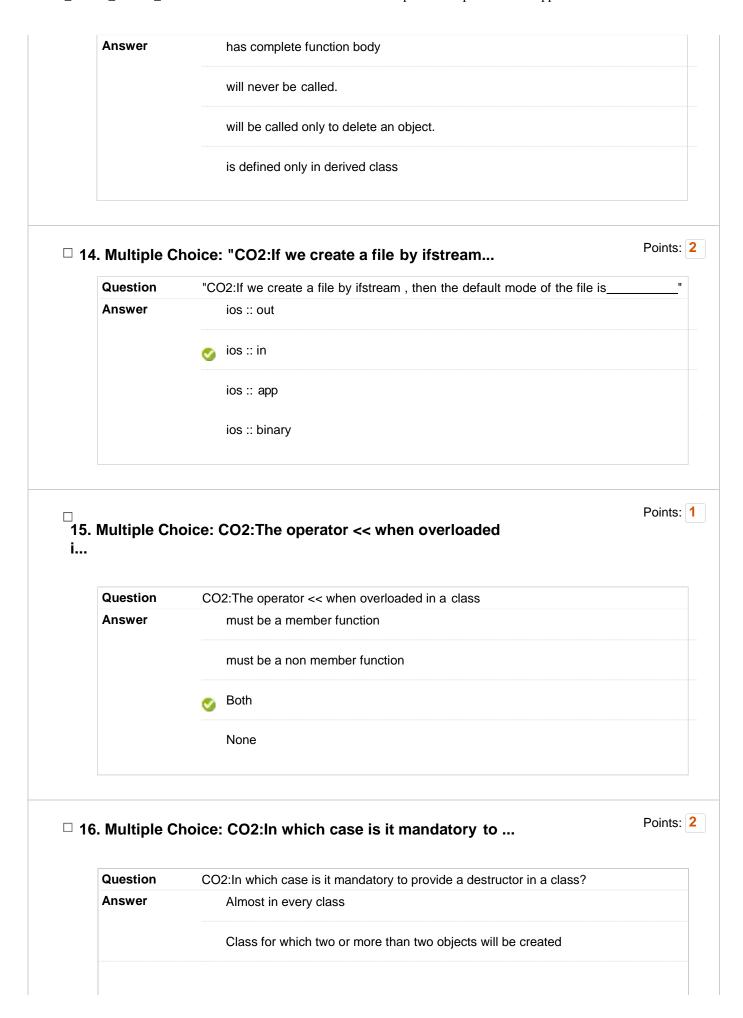
private data in A and B

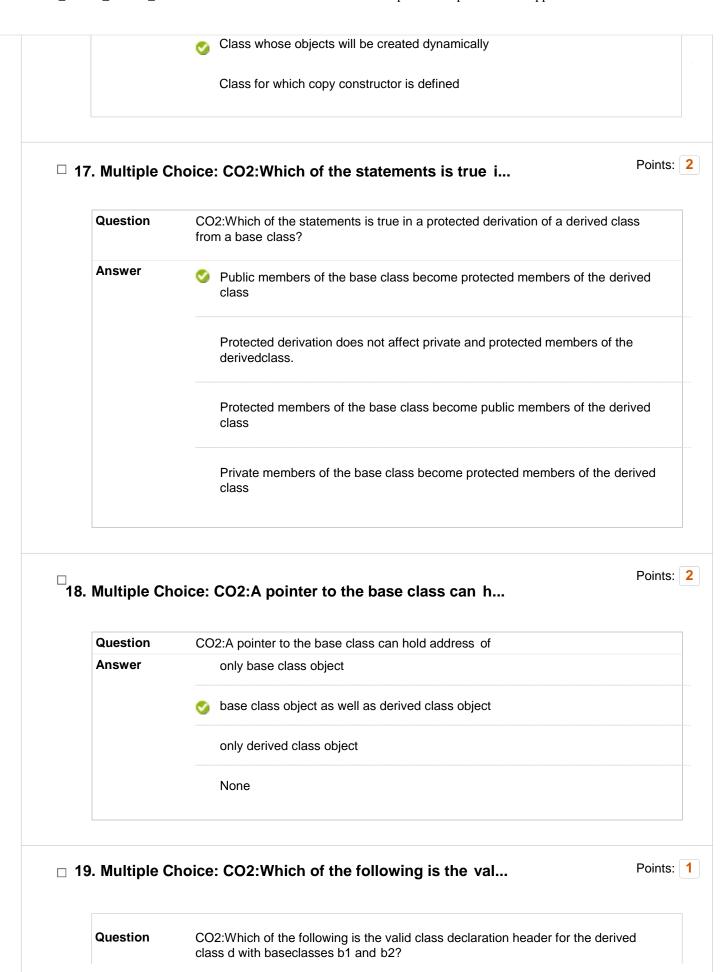
order

protected data in A and B

☐ 13. Multiple Choice: CO2:Usually a pure virtual function

Question CO2:Usually a pure virtual function





Points: 2

Answer	class d : public b1, public b2
	class d : class b1, class b2
	class d : public b1, b2
	ALL

□ 20. Multiple Choice: CO2:If there is a pointer p to object...

CO2:If there is a pointer p to object of a base class and it contains the address of an object of aderived class and both classes contain a virtual member function abc(), then the statementp->abc(); will cause the version of abc() in the _____class to be executed.

Answer

Base Class

Derived class

both

None

□ 21. Multiple Choice: CO2:The statement f1.write((char*)&a...

Question

CO2:The statement
f1.write((char*)&obj1,sizeof(obj1));

Answer

Writes the address of obj1 to f1.

Writes the data in obj1 to f1

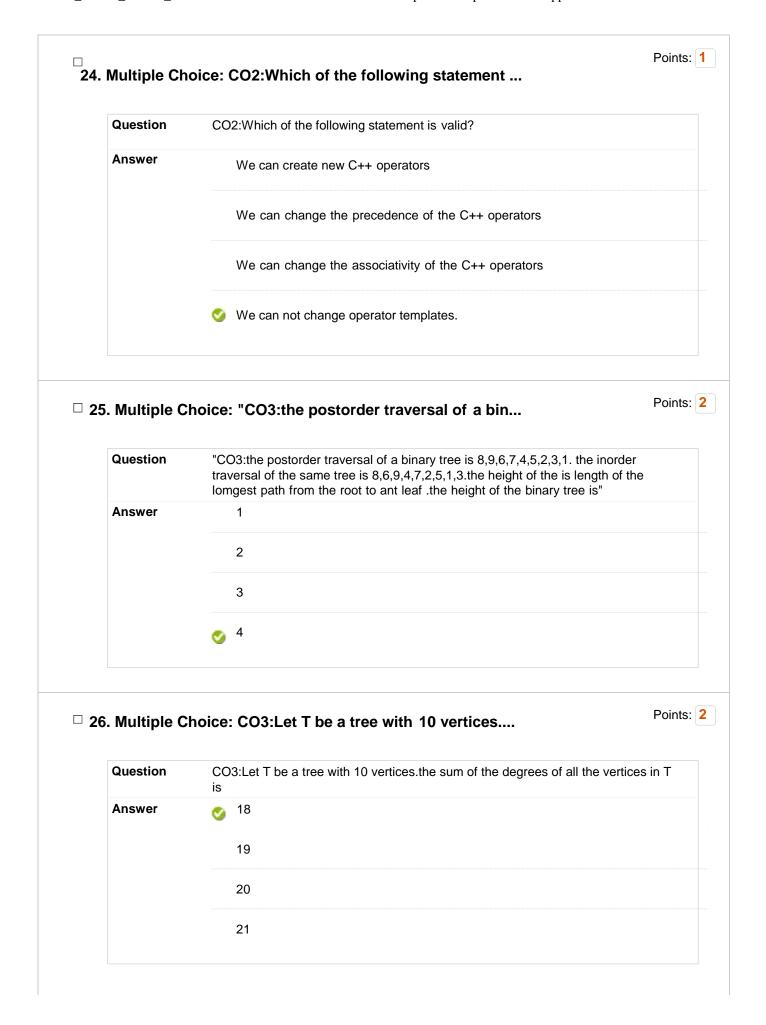
writes the member function of obj1 to f1.

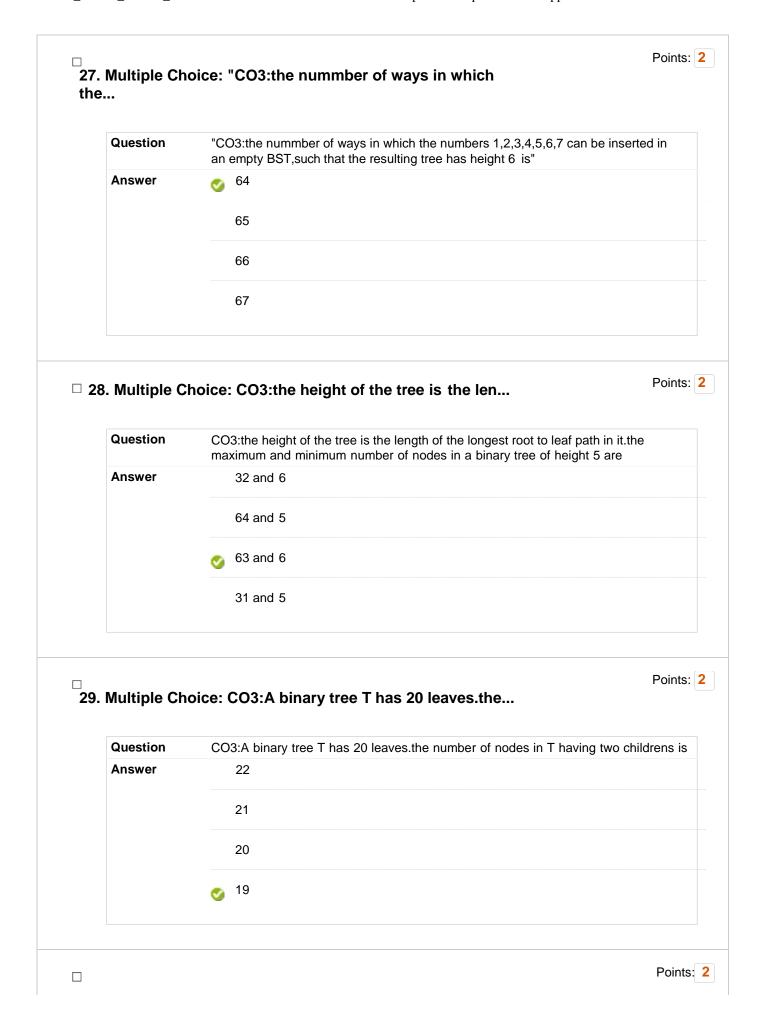
Writes the member function and the data of obj1 to f1

	oice: CO2:Consider the following class defi
Question	CO2:Consider the following class definitions:
	class a
	{
	} ;
	class b: protected a
	{
	} ;
	What happens when we try to compile this class?
Answer	Will not compile because class body of a is not defined
	Will not compile because class body of b is not defined
	Will not compile because class a is not public inherited
	Will compile successfully.
Multiple Ch	oigo: CO2:To googge the public function the
Multiple Ch	oice: CO2:To access the public function fba
Question	CO2:To access the public function fbase() in the base class, a statement in a derived class functionfder() uses the statement.fbase();
Answer	base.base();

ofbase();

fder()





30. Multiple Choice: CO3:which one of the following hash f... Question CO3:which one of the following hash functions on integers willdistribute keys most uniformly over 10 buckets numbered 0 to 9 for k ranging from 0 to 2020? **Answer** $h(k)=i^2 \mod 10$ $h(k)=i^3\mod 10$ $h(k)=(11*i^2)\mod 10$ $h(k)=(12*i) \mod 10$ Points: 1 31. Multiple Choice: "CO3:Given a hash table T with 25 slo... Question "CO3:Given a hash table T with 25 slots that stores 2000 elements, the load factor a for T is" **Answer** 50 80 60 70 Points: 1 ☐ 32. Multiple Choice: CO3:consider a binary tree T that has... Question CO3:consider a binary tree T that has 200 leaf nodes .then the number of nodes in T that have exactly two childrens are **Answer** 196 197 199 198

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33. Multiple Choice: CO3:consider a rooted n node binary t...

Question	CO3:consider a rooted n node binary tree represented using pointers.the best upper bound on the time required to dertine the number of subtrees having exactly 4 nodes is O(n^alog^bn).then the value of a+10b is
Answer	3
	4

34. Multiple Choice: "CO3:consider a hash table with 9 slo... Question "CO3:consider a hash table with 9 slots.the hash function is h(k)=k mod 9.the collisions are resolved by chaining .the following 9 keys are inserted in the order:5,28,19,15,20,33,12,17,10.the maximum,minimum,and average chain lenghts in hash table are" Answer "3,0 and 1" "3,3 and 3"

Points: 2 35. Multiple Choice: CO3:in a binary tree with n nodes eve...

Question CO3:in a binary tree with n nodes every node has an odd number of descendants.every node is considered to be its own descendant.what is the number of nodes in the tree that have exactly one child **Answer** 0 1 (n-1)/2(n-1)

☐ 36. Multiple Choice: CO3:the height of a binary tree is th...

"4,0 and 1"

"3,0 and 2"

Points: 1

Points: 1

Points: 2

Question	CO3:the height of a binary tree is the maximum number of edges in any root to leaf path.the maximum number of nodes in a binary tree of height h is
Answer	2^h-1
	2^(h-1)-1
	2^(h+1)+1
	2^(h+1)-1

37. Multiple Choice: CO4:consider the following statements...

CO4:consider the following statements I. the smallest element in a max-heap is always at a leaf node II. The second largest element in a max-heap is always a child of the root node III. A max-heap can be constructed from a BST inO(n) time IV. A BST can be constructed from a max-heap inO(n) time

Answer

"I,II and III"

"II,III and IV"

"I,III and IV"

$\hfill \square$ 38. Multiple Choice: CO4:Let T be a full binary tree with ...

CO4:Let T be a full binary tree with 8 leaves. Suppose two leaves a and b of T are chosen uniformly and independently at random. The expected value of the distance between a and b in T(i.e. the number of edges in the unique path between a and b) is

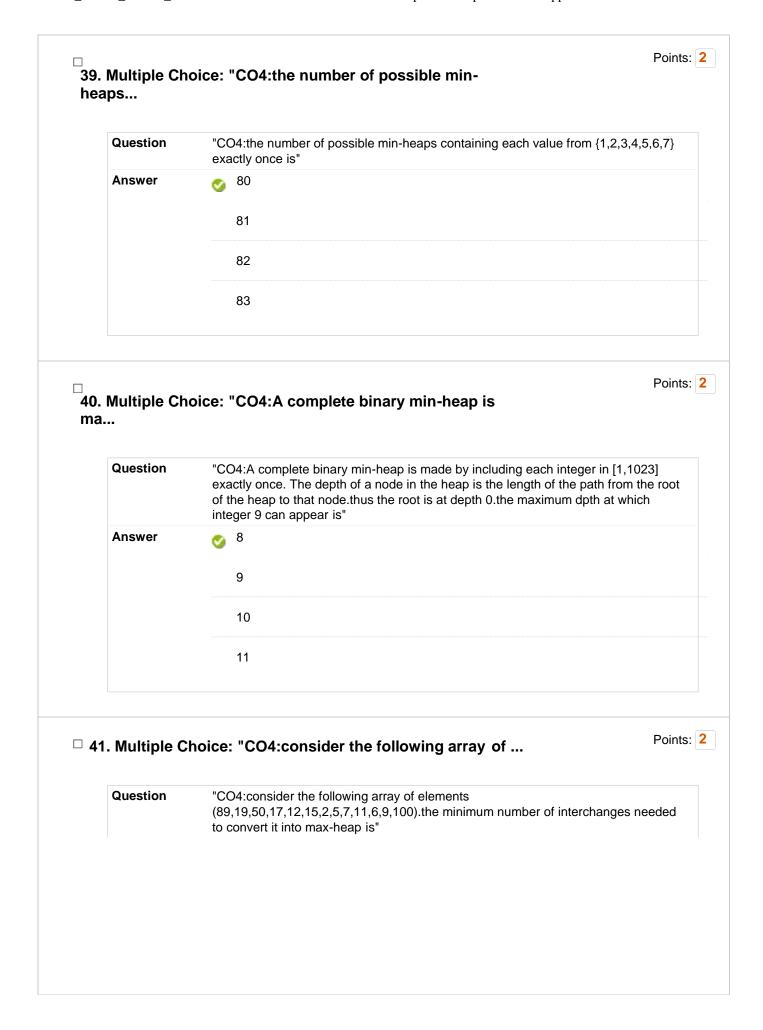
Answer

5.54

1.34

4.25

3.82

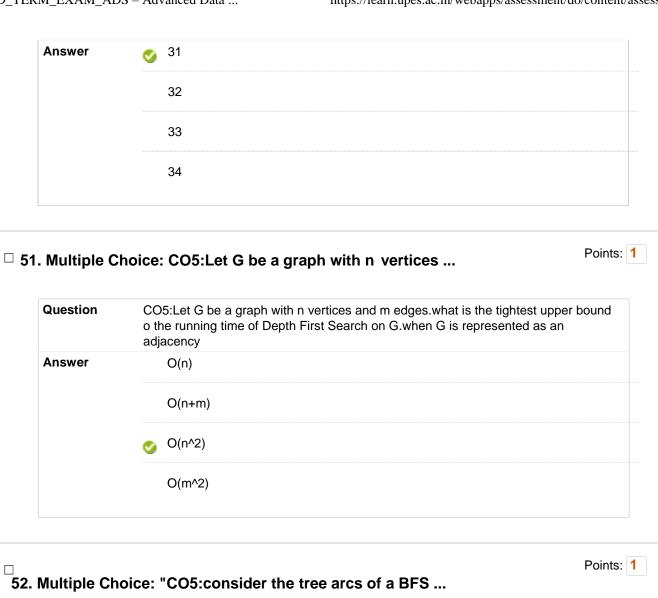


	5	
	33	
	♂ 3	
	2	
. Multiple Ch	noice: "CO4:while inserting the elements 71,	Point
Question	"CO4:while inserting the elements 71,65,84,69,67,83 in an empty BST in the sequence shown ,the element in the lowest level is"	
Answer	83	
	65	
	⊘ 67	
	69	
. Multiple Ch	noice: CO4:the worst case running time to se CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is	
_	CO4:the worst case running time to search for an element in a balanced sear	
Question	CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is	
Question	CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is O(nlogn)	
Question	CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is O(nlogn) O(n2^n)	
Question Answer . Multiple Ch	CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is O(nlogn) O(n2^n) O(n)	ch tree
Question Answer	CO4:the worst case running time to search for an element in a balanced sear with n2^n elements is O(nlogn) O(n2^n) O(n) O(logn)	Point

Test Canvas: END_TERM_EXAM_ADS – Adva	inced Data.
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	2
	3
	⊘ 4
	5
45. Multiple Ch	Poin poice: "CO4:consider a binary max-heap
Question	"CO4:consider a binary max-heap implemented using an array,which one of the following array represents a binary max-heap"
Answer	"{25,12,16,13,10,8,14}"
	"{25,14,13,16,10,8,12}"
	(25,14,16,13,10,8,12)
	"{25,14,12,13,10,8,16}"
46. Multiple Ch	Point
46. Multiple Ch	Poin noice: "CO4:in a binary max heap containing
46. Multiple Ch	Point
46. Multiple Ch	Point Proint Pro
46. Multiple Ch	Point
Question Answer	Point roice: "CO4:in a binary max heap containing "CO4:in a binary max heap containing n numbers,the smallest element can be found in time" O(nlogn) O(logn) O(n)
Question Answer	Point noice: "CO4:in a binary max heap containing "CO4:in a binary max heap containing n numbers, the smallest element can be found in time" O(nlogn) O(logn) O(n) O(1)

	All
□ 48. Multiple C	Poir Poir Poir Poir
Question	"CO4:in a complete k-ary tree, every internal node has exactly k children. the numbe of leavesin such a tree with n internal nodes is"
Answer	nk
	(n-1)k+1
	on(k-1)+1
	n(k-1)
49. Multiple Ch un	Poir noice: "CO5:Let G be a weighted connected
-	Point noice: "CO5:Let G be a weighted connected" "CO5:Let G be a weighted connected undirected graph with distinct positive edges weights.if every edge weight is increased by the same value, then which of the following statement is /are TRUE P. mininum spanning tree of G does not change
un	Point noice: "CO5:Let G be a weighted connected" "CO5:Let G be a weighted connected undirected graph with distinct positive edges weights.if every edge weight is increased by the same value, then which of the
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Question	"CO5:Let G be a weighted connected undirected graph with distinct positive edges weights.if every edge weight is increased by the same value,then which of the following statement is /are TRUE P. mininum spanning tree of G does not change Q. Shortest path between any pair of vertices does not change" P only
Question	Point indice: "CO5:Let G be a weighted connected" "CO5:Let G be a weighted connected undirected graph with distinct positive edges weights.if every edge weight is increased by the same value, then which of the following statement is /are TRUE P. mininum spanning tree of G does not change Q. Shortest path between any pair of vertices does not change" P only P



52. Multiple Choice: "CO5:consider the tree arcs of a BFS ...

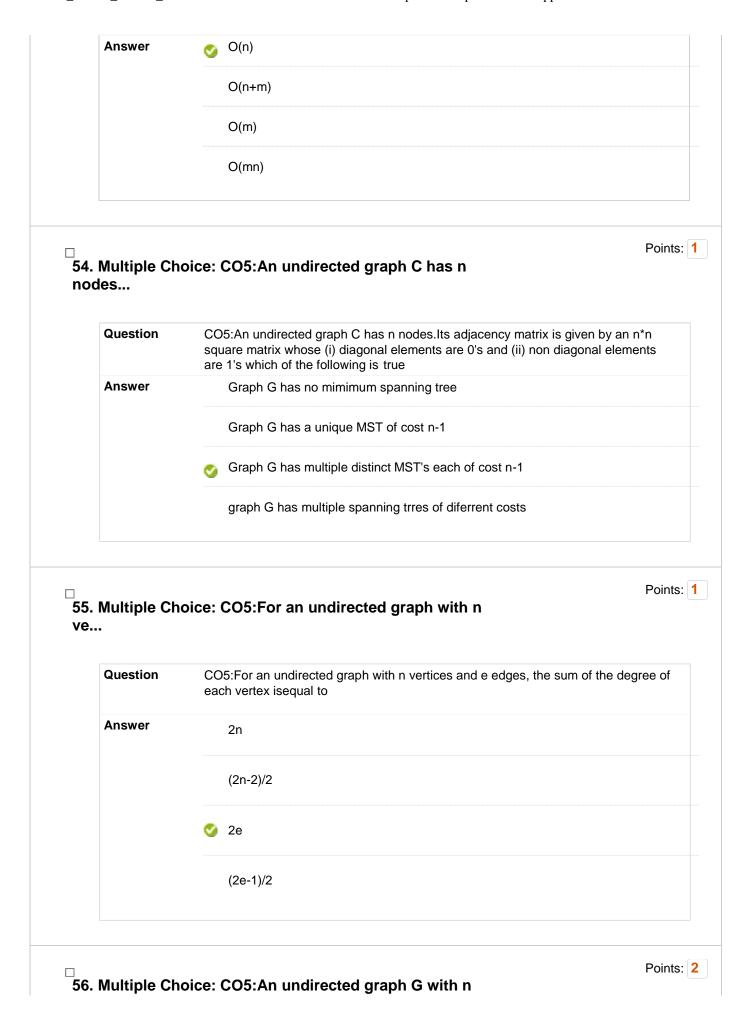
Question "CO5:consider the tree arcs of a BFS traversal from a sourcee node W in an unweighted, connected, undirected grapg. the tree T formed by the arcs is a datastructure for computing" Answer the shortest path between every pair of vertices the shortest path from W to every vertex in the graph the shortest paths from W to only those nodes that are leaves of T the longest path in graph

□ 53. Multiple Choice: CO5:the most efficient algorithm for ...

Points: 2

Question

CO5:the most efficient algorithm for finding the number of connected components in an undirected graph on n vertices and m edges has time complexity



vert... Question CO5:An undirected graph G with n vertices and e edges is represented by adjacency list. What is the time required to generate all the connected components? **Answer** O(n) O(e+1)O(n+e) O(e^2) Points: 1 57. Multiple Choice: CO5:A graph with n vertices will defi... Question CO5:A graph with n vertices will definitely have a parallel edge or self loop of the total number ofedges are **Answer** more than n more than n+1 more than (n+1)/2 more than n(n-1)/2 Points: 1 58. Multiple Choice: CO5:The maximum degree of any vertex ... Question CO5:The maximum degree of any vertex in a simple graph with n vertices is Answer n-1 n+1 2n-1 2n+1

