



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



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Course Code & Name: CSEG1004 – Advanced Data Structures

Semester: II

Programme: B.Tech. CSE (BIG DATA)

This Test has 23 attempts. For information on editing questions, click **More Help** below.

Test Canvas: END_TERM_EXAM_ADS

The Test Canvas lets you add, edit and reorder questions, as well as review a test. [More Help](#)

Question Settings

You can edit, delete or change the point values of test questions on this page. If necessary, test attempts will be regraded after you submit your changes.

Description All questions are compulsory

No Negative Marking

No. of Questions :60

Maximum Time 2 hours

- i. Do not access any other website except learn.upes.ac.in
- ii. During exam students will not be allowed to leave the room.
- iii. Mobile phones are not allowed during exam.
- iv. Don't click on submit button during exam if not finished.

Instructions

Total Questions 60

Total Points 100

Number of Attempts 23

Select: All None Select by Type: - Question Type -

Delete and Regrade

Points

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Hide Question Details

1. Multiple Choice: CO1:What is the output of the followi...

Points: 2

← OK

Question	CO1:What is the output of the following code <pre>char symbol[3]={'a','b','c'}; for (int index=0; index<3; index++) cout << symbol [index];</pre>
Answer	<input checked="" type="radio"/> a b c <input type="radio"/> "abc" <input type="radio"/> abc <input type="radio"/> '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	<input type="radio"/> if (count<100) cout << “Too many”; <input type="radio"/> if (count>100) cout >> “Too many”; <input checked="" type="radio"/> if (count>100) cout << “Too many”; <input type="radio"/> None

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	<input type="radio"/> 3,2 <input type="radio"/> 0,2

✔ 3,0

0,4



4. Multiple Choice: CO1:A function call mechanism that pa...

Points: **1**

Question	CO1:A function call mechanism that passes arguments to a function by passing a copy of the valuesof the arguments is_____
Answer	<p>call by copy</p> <p>✔ call by value</p> <p>call by reference</p> <p>call by value result</p>



5. Multiple Choice: CO1:The keyword friend does not appea...

Points: **2**

Question	CO1:The keyword friend does not appear in
Answer	<p>the class allowing access to another class.</p> <p>the class desiring access to another class</p> <p>✔ the private section of a class</p> <p>the private section of a class</p>



6. Multiple Choice: CO1:How many constructors can a class...

Points: **2**

Question	CO1:How many constructors can a class have?
Answer	0
	1
	2
	<input checked="" type="checkbox"/> un-limited

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

Points: **2**

Question	CO1:What would be the output of the following? <pre>#include<iostream.h> void main() { char *ptr="abcd"; char ch; ch = ++*ptr++; cout<<ch; }</pre>
Answer	a
	<input checked="" type="checkbox"/> b
	both
	error

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

Points: **1**

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

Answer	are not inline
	<input checked="" type="checkbox"/> are always inline.
	are not inline by default
	are inline by default, unless they are too big or too complicated.

9. Multiple Choice: CO1:What is wrong with the following ...

Points: **2**

Question	CO1:What is wrong with the following program <pre>int main() { const double PI; int n; PI = 3.14159265358979; n = 22; }</pre>
Answer	double can not be followed const
	const is un identified
	<input checked="" type="checkbox"/> PI must be initialized at the time of declaration
	error

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

Points: **2**

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: **2**

Question	CO1: <pre>#include<iostream.h> void main() { int i, j, m; int a[5]={8, 10, 1, 14, 16}; i = ++a[2]; m = a[i++]; cout <<i<<m; }</pre>
Answer	<input checked="" type="radio"/> 3 2 <hr/> <input type="radio"/> 2 2 <hr/> <input type="radio"/> 3 1 <hr/> <input type="radio"/> 2 1

12. Multiple Choice: CO2:If a class C is derived from clas...

Points: 2

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	<input type="radio"/> protected and public data only in C and B <hr/> <input type="radio"/> protected and public data only in C <hr/> <input type="radio"/> private data in A and B <hr/> <input checked="" type="radio"/> protected data in A and B

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

Points: 1

Question	CO2:Usually a pure virtual function
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Answer	has complete function body
	will never be called.
	will be called only to delete an object.
	is defined only in derived class

14. Multiple Choice: "CO2:If we create a file by ifstream...

Points: 2

Question	"CO2:If we create a file by ifstream , then the default mode of the file is _____"
Answer	ios :: out
	<input checked="" type="checkbox"/> ios :: in
	ios :: app
	ios :: binary

15. Multiple Choice: CO2:The operator << when overloaded i...

Points: 1

Question	CO2:The operator << when overloaded in a class
Answer	must be a member function
	must be a non member function
	<input checked="" type="checkbox"/> Both
	None

16. Multiple Choice: CO2:In which case is it mandatory to ...

Points: 2

Question	CO2:In which case is it mandatory to provide a destructor in a class?
Answer	Almost in every class
	Class for which two or more than two objects will be created



Class whose objects will be created dynamically

Class for which copy constructor is defined

17. Multiple Choice: CO2:Which of the statements is true i...

Points: 2

Question	CO2:Which of the statements is true in a protected derivation of a derived class from a base class?
Answer	<input checked="" type="checkbox"/> Public members of the base class become protected members of the derived class
	Protected derivation does not affect private and protected members of the derived class.
	Protected members of the base class become public members of the derived class
	Private members of the base class become protected members of the derived class

18. Multiple Choice: CO2:A pointer to the base class can h...

Points: 2

Question	CO2:A pointer to the base class can hold address of
Answer	<input type="checkbox"/> only base class object
	<input checked="" type="checkbox"/> base class object as well as derived class object
	<input type="checkbox"/> only derived class object
	<input type="checkbox"/> None

19. Multiple Choice: CO2:Which of the following is the val...

Points: 1

Question	CO2:Which of the following is the valid class declaration header for the derived class d with baseclasses b1 and b2?
-----------------	--

Answer	<input type="checkbox"/> class d : public b1, public b2
	<input type="checkbox"/> class d : class b1, class b2
	<input type="checkbox"/> class d : public b1, b2
	<input type="checkbox"/> ALL

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

Points: **1**

Question	CO2:If there is a pointer p to object of a base class and it contains the address of an object of a derived class and both classes contain a virtual member function abc(), then the statement p->abc(); will cause the version of abc() in the _____ class to be executed.
Answer	<input type="checkbox"/> Base Class
	<input checked="" type="checkbox"/> Derived class
	<input type="checkbox"/> both
	<input type="checkbox"/> None

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

Points: **2**

Question	CO2:The statement f1.write((char*)&obj1,sizeof(obj1));
Answer	<input type="checkbox"/> Writes the address of obj1 to f1.
	<input checked="" type="checkbox"/> Writes the data in obj1 to f1
	<input type="checkbox"/> writes the member function of obj1 to f1.
	<input type="checkbox"/> Writes the member function and the data of obj1 to f1



Points: 2

22. Multiple Choice: 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	<input type="radio"/> Will not compile because class body of a is not defined <input type="radio"/> Will not compile because class body of b is not defined <input type="radio"/> Will not compile because class a is not public inherited <input checked="" type="radio"/> Will compile successfully.



Points: 1

23. Multiple Choice: 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	<input type="radio"/> base.base(); <input type="radio"/> base::fbase(); <input checked="" type="radio"/> fbase(); <input type="radio"/> fder()



Points: 1

24. Multiple Choice: CO2:Which of the following statement ...

Question	CO2:Which of the following statement is valid?
Answer	<p>We can create new C++ operators</p> <hr/> <p>We can change the precedence of the C++ operators</p> <hr/> <p>We can change the associativity of the C++ operators</p> <hr/> <p><input checked="" type="checkbox"/> We can not change operator templates.</p>



Points: 2

25. Multiple Choice: "CO3:the postorder traversal of a bin...

Question	"CO3:the postorder traversal of a binary tree is 8,9,6,7,4,5,2,3,1. the inorder traversal of the same tree is 8,6,9,4,7,2,5,1,3.the height of the is length of the longest path from the root to ant leaf .the height of the binary tree is"
Answer	<p>1</p> <hr/> <p>2</p> <hr/> <p>3</p> <hr/> <p><input checked="" type="checkbox"/> 4</p>



Points: 2

26. Multiple Choice: CO3:Let T be a tree with 10 vertices....

Question	CO3:Let T be a tree with 10 vertices.the sum of the degrees of all the vertices in T is
Answer	<p><input checked="" type="checkbox"/> 18</p> <hr/> <p>19</p> <hr/> <p>20</p> <hr/> <p>21</p>



Points: 2

27. Multiple Choice: "CO3:the number of ways in which the...

Question	"CO3:the number of ways in which the numbers 1,2,3,4,5,6,7 can be inserted in an empty BST,such that the resulting tree has height 6 is"
Answer	<input checked="" type="radio"/> 64
	<input type="radio"/> 65
	<input type="radio"/> 66
	<input type="radio"/> 67



Points: 2

28. Multiple Choice: CO3:the height of the tree is the len...

Question	CO3:the height of the tree is the length of the longest root to leaf path in it.the maximum and minimum number of nodes in a binary tree of height 5 are
Answer	<input type="radio"/> 32 and 6
	<input type="radio"/> 64 and 5
	<input checked="" type="radio"/> 63 and 6
	<input type="radio"/> 31 and 5



Points: 2

29. Multiple Choice: CO3:A binary tree T has 20 leaves.the...

Question	CO3:A binary tree T has 20 leaves.the number of nodes in T having two childrens is
Answer	<input type="radio"/> 22
	<input type="radio"/> 21
	<input type="radio"/> 20
	<input checked="" type="radio"/> 19



Points: 2

30. Multiple Choice: CO3:which one of the following hash f...

Question	CO3:which one of the following hash functions on integers will distribute keys most uniformly over 10 buckets numbered 0 to 9 for k ranging from 0 to 2020?
Answer	<input type="checkbox"/> $h(k)=i^2 \text{ mod } 10$
	<input checked="" type="checkbox"/> $h(k)=i^3 \text{ mod } 10$
	<input type="checkbox"/> $h(k)=(11*i^2) \text{ mod } 10$
	<input type="checkbox"/> $h(k)=(12*i) \text{ mod } 10$

**31. Multiple Choice: "CO3:Given a hash table T with 25 slo...**Points: **1**

Question	"CO3:Given a hash table T with 25 slots that stores 2000 elements,the load factor a for T is"
Answer	<input type="checkbox"/> 50
	<input checked="" type="checkbox"/> 80
	<input type="checkbox"/> 60
	<input type="checkbox"/> 70

**32. Multiple Choice: CO3:consider a binary tree T that has...**Points: **1**

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	<input type="checkbox"/> 196
	<input type="checkbox"/> 197
	<input checked="" type="checkbox"/> 199
	<input type="checkbox"/> 198

**33. Multiple Choice: CO3:consider a rooted n node binary t...**Points: **2**

Question	CO3:consider a rooted n node binary tree represented using pointers.the best upper bound on the time required to determine the number of subtrees having exactly 4 nodes is $O(n^{\log^2 n})$.then the value of $a+10b$ is
Answer	<input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input checked="" type="radio"/> 1

34. Multiple Choice: "CO3:consider a hash table with 9 slo...

Points: **1**

Question	"CO3:consider a hash table with 9 slots.the hash function is $h(k)=k \bmod 9$.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 lengths in hash table are"
Answer	<input checked="" type="radio"/> "3,0 and 1" <input type="radio"/> "3,3 and 3" <input type="radio"/> "4,0 and 1" <input type="radio"/> "3,0 and 2"

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

Points: **2**

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	<input checked="" type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> $(n-1)/2$ <input type="radio"/> $(n-1)$

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

Points: **1**

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	<input type="radio"/> 2^h-1 <input type="radio"/> $2^{(h-1)}-1$ <input type="radio"/> $2^{(h+1)}+1$ <input checked="" type="radio"/> $2^{(h+1)}-1$



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

Points: **2**

Question	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 in $O(n)$ time IV. A BST can be constructed from a max-heap in $O(n)$ time
Answer	<input checked="" type="radio"/> "I,II and III" <input type="radio"/> "II,III and IV" <input type="radio"/> "I,III and IV" <input type="radio"/> "I,II and IV"



38. Multiple Choice: CO4:Let T be a full binary tree with ...

Points: **2**

Question	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	<input type="radio"/> 5.54 <input type="radio"/> 1.34 <input checked="" type="radio"/> 4.25 <input type="radio"/> 3.82

Points: 2

39. Multiple Choice: "CO4:the number of possible min-heaps...

Question	"CO4:the number of possible min-heaps containing each value from {1,2,3,4,5,6,7} exactly once is"
Answer	<input checked="" type="radio"/> 80
	<input type="radio"/> 81
	<input type="radio"/> 82
	<input type="radio"/> 83

Points: 2

40. Multiple Choice: "CO4:A complete binary min-heap is ma...

Question	"CO4:A complete binary min-heap is made by including each integer in [1,1023] exactly once. The depth of a node in the heap is the length of the path from the root of the heap to that node.thus the root is at depth 0.the maximum dpth at which integer 9 can appear is"
Answer	<input checked="" type="radio"/> 8
	<input type="radio"/> 9
	<input type="radio"/> 10
	<input type="radio"/> 11

Points: 2

41. Multiple Choice: "CO4:consider the following array of ...

Question	"CO4:consider the following array of elements (89,19,50,17,12,15,2,5,7,11,6,9,100).the minimum number of interchanges needed to convert it into max-heap is"
----------	--

Answer	4
	5
<input checked="" type="radio"/>	3
	2



Points: 2

42. Multiple Choice: "CO4:while inserting the elements 71,...

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
<input checked="" type="radio"/>	67
	69



Points: 2

43. Multiple Choice: CO4:the worst case running time to se...

Question	CO4:the worst case running time to search for an element in a balanced search tree with n^2^n elements is
Answer	$O(n \log n)$
	$O(n^{2^n})$
<input checked="" type="radio"/>	$O(n)$
	$O(\log n)$



Points: 2

44. Multiple Choice: CO4:what is the maximum height of any...

Question	CO4:what is the maximum height of any AVL-tree with 7 nodes? Assume that the height of a tree with a single node is 0
-----------------	---

Answer	2
	3
<input checked="" type="checkbox"/>	4
	5



Points: 2

45. Multiple Choice: "CO4:consider a binary max-heap imple...

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}"
<input checked="" type="checkbox"/>	"{25,14,16,13,10,8,12}"
	"{25,14,12,13,10,8,16}"



Points: 2

46. Multiple Choice: "CO4:in a binary max heap containing ...

Question	"CO4:in a binary max heap containing n numbers,the smallest element can be found in time"
Answer	$O(n \log n)$
	$O(\log n)$
<input checked="" type="checkbox"/>	$O(n)$
	$O(1)$



Points: 1

47. Multiple Choice: CO4:An Abstract Data Type is

Question	CO4:An Abstract Data Type is
Answer	same as an abstract class

a data type that cannot be instantiated

"a data type type for which only the operations defined on it can be used ,but none else"

All

48. Multiple Choice: "CO4:in a complete k-ary tree,every i...

Points: 2

Question	"CO4:in a complete k-ary tree,every internal node has exactly k children.the number of leavesin such a tree with n internal nodes is"
Answer	<p>nk</p> <p>(n-1)k+1</p> <p><input checked="" type="checkbox"/> n(k-1)+1</p> <p>n(k-1)</p>

49. Multiple Choice: "CO5:Let G be a weighted connected un...

Points: 2

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. minimum spanning tree of G does not change Q. Shortest path between any pair of vertices does not change"
Answer	<p><input checked="" type="checkbox"/> P only</p> <p>Q</p> <p>None</p> <p>Both</p>

50. Multiple Choice: "CO5:Breadth First Search is started ...

Points: 2

Question	"CO5:Breadth First Search is started on a binary tree beginning from the root vertex.there is a vertex t at a distance four from root . If t is the n-th vertex in this BFS traversal,then the maximum possible value of n is"
-----------------	--

Answer	<input checked="" type="radio"/> 31
	<input type="radio"/> 32
	<input type="radio"/> 33
	<input type="radio"/> 34

51. Multiple Choice: CO5:Let G be a graph with n vertices ...

Points: **1**

Question	CO5:Let G be a graph with n vertices and m edges.what is the tightest upper bound o the running time of Depth First Search on G.when G is represented as an adjacency
Answer	<input type="radio"/> O(n)
	<input type="radio"/> O(n+m)
	<input checked="" type="radio"/> O(n^2)
	<input type="radio"/> O(m^2)

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

Points: **1**

Question	"CO5:consider the tree arcs of a BFS traversal from a sourece node W in an unweighted,connected,undirected grapp.the tree T formed by the arcs is a datastructure for computing"
Answer	<input type="radio"/> the shortest path between every pair of vertices
	<input checked="" type="radio"/> the shortest path from W to every vertex in the graph
	<input type="radio"/> the shortest paths from W to only those nodes that are leaves of T
	<input type="radio"/> 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
-----------------	--

Answer	<input checked="" type="checkbox"/> $O(n)$
	$O(n+m)$
	$O(m)$
	$O(mn)$



Points: 1

54. Multiple Choice: CO5:An undirected graph C has n nodes...

Question	CO5:An undirected graph C has n nodes.Its adjacency matrix is given by an $n \times n$ square matrix whose (i) diagonal elements are 0's and (ii) non diagonal elements are 1's which of the following is true
Answer	Graph G has no mimimum spanning tree
	Graph G has a unique MST of cost $n-1$
	<input checked="" type="checkbox"/> Graph G has multiple distinct MST's each of cost $n-1$
	graph G has multiple spanning trres of diferrent costs



Points: 1

55. Multiple Choice: CO5:For an undirected graph with n ve...

Question	CO5:For an undirected graph with n vertices and e edges, the sum of the degree of each vertex is equal to
Answer	$2n$
	$(2n-2)/2$
	<input checked="" type="checkbox"/> $2e$
	$(2e-1)/2$



Points: 2

56. Multiple Choice: CO5:An undirected graph G with n

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	<input type="radio"/> O(n) <input type="radio"/> O(e+1) <input checked="" type="radio"/> O(n+e) <input type="radio"/> 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 of edges are
Answer	<input type="radio"/> more than n <input type="radio"/> more than n+1 <input type="radio"/> more than (n+1)/2 <input checked="" type="radio"/> 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	<input checked="" type="radio"/> n-1 <input type="radio"/> n+1 <input type="radio"/> 2n-1 <input type="radio"/> 2n+1



Points: **1**

59. 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 if the total number of edges are
Answer	<input checked="" type="checkbox"/> greater than n - 1 <input type="checkbox"/> less than $n(n - 1)$ <input type="checkbox"/> greater than $n(n - 1)/2$ <input type="checkbox"/> less than $n^2/2$



Points: **2**

60. Multiple Choice: CO5:An adjacency matrix representatio...

Question	CO5:An adjacency matrix representation of a graph cannot contain information of :
Answer	<input type="checkbox"/> nodes <input type="checkbox"/> edges <input checked="" type="checkbox"/> direction of edges <input type="checkbox"/> parallel edges

[All](#) [None](#)

- Question Type -

Delete and Regrade

Select by Type:

Update and Regrade

Hide Question Details

Points