Advanced Data Structures End Sem. Exam, 12 July 2020

Program : B.Tech CS- AI&ML   Course Code: CSEG1004   Semester: II

1	MC	Stack can be implemented using _____ and _____ ?	Array & Binary Tree	Incorrect	Linked list & Graph	Incorrect	Array & linked List	Correct	Queue & Linked List	Incorrect
2	MC	When a base class is privately inherited by a derived class public members of the base class become ………. of the derived class.	Private members	Correct	protected members	Incorrect	public members	Incorrect	not inherited	Incorrect
3	MC	The minimum number of interchanges needed to convert the array *89, 19, 40, 17, 12, 10, 2, 5, 7, 11, 6, 9, 70* into a heap with the maximum element at the root is	2	Correct	3	Incorrect	4	Incorrect	5	Incorrect
4	MC	Consider a two dimensional array A[20][10]. Assume 4 words per memory cell, the base address of array A is 100, elements are stored in row-major order and first element is A[0][0]. What is the address of A[11][5] ?	520	Incorrect	540	Incorrect	560	Correct	512	correct
5	MC	What will be the order of execution of base class constructors in the following method of inheritance? class A: public B, virtual public C {....};	B(); C(); A();	Incorrect	C(); B(); A();	Correct	A(); B(); C();	Incorrect	B(); A(); C();	Incorrect
6	MC	Which of the following cannot be overloaded in C++?	Increment operator	Incorrect	Constructor	Incorrect	Destructor	Correct	New & Delete Operator	Incorrect
7	MC	Which of the following is the most widely used external memory data structure?	AVL Tree	Incorrect	B Tree	Correct	Red Black Tree	Incorrect	Both AVL Tree and Red Black Tree	Incorrect

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#	Type	Question	Option A		Option B		Option C		Option D	
8	MC	B-tree of order n is a order-n multiway tree in which each non-root node contains _____	at most (n − 1)/2 keys	Incorrect	exact (n − 1)/2 keys	Incorrect	at least 2n keys	Incorrect	at least (n − 1)/2 keys	correct
9	MC	A B-tree of order 4 and of height 3 will have a maximum of _____ keys.	255	Correct	256	Incorrect	127	Incorrect	63	Incorrect
10	MC	What is direct addressing?	different loaction in array for every available key	Correct	less array positions as compare to keys	Incorrect	less keys than array positions	Incorrect	None of the above	Incorrect
11	MC	In simple uniform hashing, what is the search complexity?	O(2)	Incorrect	O(1)	Correct	O(logn)	Incorrect	O(log2n)	Incorrect
12	MC	BFS is better than DFS in case of _____	When the Graph is complex	Incorrect	When graphs consists of many nodes	Incorrect	when the graph's depth is large	Correct	when the graph's width is large	Incorrect
13	MC	The space factor when determining the efficiency of algorithmis measured by	Compute the time needed by algorithm	Incorrect	Compute the maximum memory needed by the algorithm	Correct	Compute the maximum Disk space needed by the algorithm	Incorrect	Compute the average memory needed by the algorithm	Incorrect
14	MC	The post order traversal of binary tree is DEBGFCA, find out the preorder traversal	ABDECFG	Correct	ABDGFCE	Incorrect	ABCDEFG	Incorrect	ABCGFDE	Incorrect
15	MC	If every node n in Graph G is adjacent to every other node m in G . Graph G is said to be	strongly connected	Incorrect	finite	Incorrect	complete	Correct	dense	Incorrect
16	MC	Which of the following is not an application of Breadth First Search?	Finding shortest path between two nodes	Incorrect	Finding bipartiteness of a graph	Incorrect	GPS navigation system	Incorrect	Path Finding	correct
17	MC	Stack data structure cannot be used for	Implementation of Recursive Function	Incorrect	Allocation Resources and Scheduling	Correct	Reversing string	Incorrect	Evaluation of string in postfix form	Incorrect

18	MC	Which one of the following is an application of Queue Data Structure?	When data is transferred asynchronously (data not necessarily received at same rate as sent) between two processes	Incorrect	When a resource is shared among multiple consumers.	Incorrect	Load Balancing	Incorrect	All Of Above	correct
19	MC	In which of the following cases is it possible to obtain different results for call- by-reference and call- by-parameter parameter passing	Passing an expression as a parameter	Incorrect	Passing an array as a parameter	Incorrect	passing a pointer as a parameter	Incorrect	Passing an array element as a parameter	correct
20	MC	Heap allocation is required for languages	that supports recursion	Incorrect	that supports dynamic data structures	correct	that use dynamic scope rules	Incorrect	None of the above	Incorrect
21	MC	An Abstratct datatype (ADT) is	same as an abstract class	Incorrect	"a data type for which only operations defined on it can be used , but none else"	Correct	none of above	Incorrect	all of above	Incorrect
22	MC	which of the following are essential features of an object - oriented programming languages? 1. Abstraction & Encapsulation 2. Strictly-typedness 3. Type safe property coupled with sub type rule 4. Polymorphism in the presence of inheritance	1 and 2 only	Incorrect	1 and 4 only	Correct	"1,2 and 4 only"	Incorrect	"1,3 and 4 only"	Incorrect

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23	MC	Linked lists are not suitable data structures of which one of the following problems?	Insertion sort	Incorrect	Binary Search	Correct	Radix sort	Incorrect	Ploynomial manipulation	Incorrect
24	MC	"In worst case , the number of comparisons needed to search singly linked list of length n for a given element is "	log2 n	Incorrect	n/2	Incorrect	log2 n-1	Incorrect	n	correct
25	MC	Level order traversal of a rooted tree can be done by starting from the root and performing	Preorder traversal	Incorrect	inorder traversal	Incorrect	depth first search	Incorrect	breadth first search	correct
26	MC	What is a copy constructor?	A constructor that allows a user to move data from one object to another	Incorrect	A constructor to initialize an object with the values of another object	Correct	A constructor to check the whether to objects are equal or not	Incorrect	A constructor to kill other copies of a given object.	Incorrect
27	MC	What happens if a user forgets to define a constructor inside a class?	Error occurs	Incorrect	Segmentation fault	Incorrect	Objects are not created properly	Incorrect	Compiler provides a default constructor to avoid faults/errors	correct
28	MC	When destructors are called?	When a program ends	Incorrect	When a function ends	Incorrect	When a delete operator is used	Incorrect	All of the mentioned	correct
29	MC	Which of the following is an advantage of adjacency list representation over adjacency matrix representation of a graph?	"In adjacency list representation, space is saved for sparse graphs"	Incorrect	DFS and BSF can be done in O(V + E) time for adjacency list representation. These operations take O(V^2) time in adjacency matrix representation. Here is V and E	Incorrect	Adding a vertex in adjacency list representation is easier than adjacency matrix representation.	Incorrect	All of the above	correct

					are number of vertices and edges respectively.					
30	MC	"On which of the following statements does the time complexity of checking if an edge exists between two particular vertices or not, depends?"	Depends on the number of edges	Incorrect	Depends on the number of vertices	Incorrect	Is independent of both the number of edges and vertices	Correct	It depends on both the number of edges and vertices	Incorrect
31	MC	Which of the following algorithms can be used to most efficiently determine the presence of a cycle in a given graph ?	Depth First Search	Correct	Breadth First Search	Incorrect	Prim's Minimum Spanning Tree Algorithm	Incorrect	Kruskal' Minimum Spanning Tree Algorithm	Incorrect
32	MC	The Breadth First Search traversal of a graph will result into?	Linked List	Incorrect	Tree	Correct	Graph with back edges	Incorrect	all of above	Incorrect
33	MC	Which is correct syntax ?	"myfile:open ("""example.bin""", ios::out);"	Incorrect	"myfile.open ("""example.bin""", ios::out);"	Correct	"myfile::open ("""example.bin""", ios::out);"	Incorrect	"myfile.open ("""example.bin""", ios:out);"	Incorrect
34	MC	Which of the following true about FILE *fp	FILE is a structure and fp is a pointer to the structure of FILE type	Correct	FILE is a buffered stream	Incorrect	FILE is a keyword in C for representing files and fp is a variable of FILE type	Incorrect	FILE is a stream	Incorrect
35	MC	Which of the following defines the role of access specifiers within a class in Abstraction?	Abstaction concept is not used in classes	Incorrect	They helps in keeping things together	Incorrect	They do not help in any way	Incorrect	They allows us to show only required things to outer world	Correct
36	MC	Select the correct syntax of overloading operator '+' for class X	int [+](argument_list){}	Incorrect	int +(argument_list){}	Incorrect	X operator[+](argument_list){}	Incorrect	X operator+(argument_list){}	Correct
37	MC	What is true in case of pass by reference?	The function declaration should contain $	Incorrect	The location of variable in memory is passed to the function so	Correct	The function declaration and defination may contain pointers	Incorrect	The function declaration and call should contain ampersand(&)	Incorrect

					that it can use the same memory area for its processing					
38	MC	"A binary search tree is generated by inserting in order the following integers: 50,15,62,5,20,58,91,3,8,37,60,24,61 The number of nodes in the left subtree and right subtree of the root respectively is"	"(7,5)"	Correct	"(5,7)"	Incorrect	"(8,4)"	Incorrect	"(4,8)"	Incorrect
39	MC	A binary search tree is used to locate the number 43. Which of the following probe sequences is possible	2 3 50 40 60 43	Incorrect	17 77 27 66 18 43	Incorrect	10 65 31 48 37 43	Correct	81 61 52 41 14 43	Incorrect
40	MC	"The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 6, 12, 16. What is the height of the binary search tree (the height is the maximum distance of a leaf node from the root)?"	2	Incorrect	3	Incorrect	4			
41	MC	What is the maximum height of any AVL-tree with 8 nodes? Assume that the height of a tree with a single node is 0.	2	Incorrect	3	Incorrect	4	Correct	5	Incorrect
42	MC	"While inserting the elements 71, 65, 84, 69, 67, 83 in an empty binary search tree (BST) in the	67	Correct	65	Incorrect	84	Incorrect	69	Incorrect

		sequence shown, the element in the lowest level is"									
43	MC	An advantage of chained hash table (external hashing) over the open addressing scheme is	Worst case complexity of search operations is less	Incorrect	Space used is less	Incorrect	Deletion is easier	Correct	None of the above		Incorrect
44	MC	"A hash table contains 10 buckets and uses linear probing to resolve collisions. The key values are integers and the hash function used is key % 10. If the values 43, 165, 62, 123, 142 are inserted in the table, in what location would the key value 142 be inserted?"	2	Incorrect	3	Incorrect	4	Incorrect	6		Correct
45	MC	"Consider a hash table of size 11 that uses open addressing with linear probing. Let h(k) = k mod 11 be the hash function used. A sequence of records with keys 43 36 92 87 11 4 71 13 14 is inserted into an initially empty hash table, the bins of which are indexed from zero to ten. What is the index of the bin into which the last record is inserted?"	4	Incorrect	5	Incorrect	6	Incorrect	7		Correct
46	MC	"The minimum number of interchanges needed to convert the array into a max-heap is: 89, 19, 40, 17, 12, 10, 2, 5, 7, 11, 6, 9, 30"	0	Incorrect	1	Correct	2	Incorrect	3		Incorrect
47	MC	"A priority queue is implemented as a Max-Heap. Initially, it has 5	"10, 8, 7, 5, 3, 2, 1"	Incorrect	"10, 8, 7, 2, 3, 1, 5"	Incorrect	"10, 8, 7, 1, 2, 3, 5"	Incorrect	"10, 8, 7, 3, 2, 5, 1"		Correct

		elements. The level-order traversal of the heap is: 10, 8, 5,3, 2. Two new elements 1 and 7 are inserted into the heap in that order. The level-order traversal of the heap after the insertion of the elements is:"									
48	TF	It is possible to construct a binary tree uniquely whose pre-order and post-order traversals are given	FALSE								
49	TF	The cost of searching an AVL tree is ? (log n) but that of a binary search tree is O(n)	TRUE								
50	MC	"A binary search tree contains the numbers 1, 2, 3, 4, 5, 6, 7, 8. When the tree is traversed in pre-order and the values in each node printed out, the sequence of values obtained is 5, 3, 1, 2, 4, 6, 8, 7. If the tree is traversed in post-order, the sequence obtained would be"	"8, 7, 6, 5, 4, 3, 2, 1"	Incorrect	"1, 2, 3, 4, 8, 7, 6, 5"	Incorrect	"2, 1, 4, 3, 6, 7, 8, 5"	Incorrect	"2, 1, 4, 3, 7, 8, 6, 5"	Correct
51	TF	A hash function may give the same hash value for distinct messages.	TRUE								
52	MC	"Given that hash table T with 25 slots that stores 2050 elements, the load factor for T is _____."	80	Incorrect	82	Correct	81	Incorrect	84	Incorrect
53	MC	How many edges are there in Complete Graph with 6 Vertices	10	Incorrect	15	Correct	12	Incorrect	14	Incorrect
54	MC	A binary tree T has 20 leaves. The number of nodes in T having two children is _____.	10	Incorrect	20	Incorrect	5	Incorrect	19	Correct

55	TF	"In nested try blocks, there is no need to specify catch handler for inner try block. Outer catch handler is sufficient for the program."	FALSE							
56	TF	We can prevent a function from throwing any exceptions.	TRUE							
57	MC	The following C++ declarations Struct node{ Int I; Float j; }; Struct node *s[10]; Defines s to be	An Array, each element of which is a pointer to a structure of type node.	Correct	A structure of 2 fields, each filed being a pointer to an array of 10 elements.	Incorrect	A structure of 3 fields: an integer, a float and an array of 10 elements.	Incorrect	An array, each element of which is a structure of type node.	Incorrect
58	MC	The value of j at the end of the execution of the following program is: Int demo(int i) { Static int count = 0; Count= count+ I; return (count); } Main(){ Int I ,j; For(i=0;i<4;i++) J=demo(i); }	10	Correct	4	Incorrect	6	Incorrect	7	Incorrect
59	MC	consider the following c++ program segment:	gnirts	Incorrect	string	Incorrect	gnirt	Incorrect	No output is printed	correct

		int main()
		{
		char p[20];
		char * s = "string";
		int length = strlen(s);
		for(int i=0;i<length;i++)
		p[i]=s[length-i];
		cout<<p;
		return 0;
		}
		The output of the program is:									

60	MC	```#include <iostream>
using namespace std;

int main()
{
    try
    {
        throw 'a';
    }
    catch (int param)
    {
        cout << "int
exception\n";
    }
    catch (...)
    {
        cout << "default
exception\n";
    }
    cout << "After
Exception";
    return 0; }``` | default exception
After Exception | Correct | int exception
After Exception | Incorrect | int exception | Incorrect | default exception | Incorrect |

61	MC	How many member functions are there in this C++ class excluding constructors and destructors?	1		Incorrect	2		Correct	3		Incorrect	4		Incorrect

```cpp
class Box
{
        int capacity;
    public:
        void print();
        friend void show();
        bool compare();
        friend bool lost();
};
```