University of Mumbai

Examination 2020 under cluster RGIT (Lead College: PCE)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **Computer**

Curriculum Scheme: Rev2019

Examination: SE Semester III

Course Code: **CSC303** and Course Name: **Data Structure**

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Minimum number of fields in each node of a doubly linked list is ____
Option A:	2
Option B:	3
Option C:	4
Option D:	1
2.	A parentheses checker program would be best implemented using
Option A:	List
Option B:	Queue
Option C:	Stack
Option D:	Graph
3.	A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called
Option A:	AVL tree
Option B:	Red-black tree
Option C:	Lemma tree
Option D:	B+ Tree
4.	Stack is also called as
Option A:	Last in first out
Option B:	First in last out
Option C:	Last in last out
Option D:	First in first out
5.	Which of the following is true about the characteristics of abstract data types? i) It exports a type. ii) It exports a set of operations
Option A:	True, False
Option B:	False, True
Option C:	True, True
Option D:	False, False
6.	Which of the following is not the type of queue?
Option A:	Ordinary queue
Option B:	Single ended queue

Option C:	Circular queue
Option D:	Priority queue
7.	Which of the following data structure is required to convert arithmetic expression in infix to its equivalent postfix notation?
Option A:	Queue
Option B:	Linked List
Option C:	BST
Option D:	Stack
8.	To perform level-order traversal on a binary tree, which of the following data structure will be required?
Option A:	Hash Table
Option B:	Queue
Option C:	BST
Option D:	Stack
9.	The elements of a linked list are stored
Option A:	In a structure
Option B:	In an array
Option C:	Anywhere the computer has space for them
Option D:	In contiguous memory locations
10.	A graph is a tree if and only if graph is
Option A:	Directed graph
Option B:	Contains no cycle
Option C:	Planar
Option D:	Completely connected
11.	In--------search start at the beginning of the list and check every element in the list.
Option A:	Linear search
Option B:	Binary search
Option C:	Hash Search
Option D:	Binary Tree search
12.	In a circular queue the value of r will be ..
Option A:	r=r+1
Option B:	r=(r+1)% [QUEUE_SIZE – 1]
Option C:	r=(r+1)% QUEUE_SIZE
Option D:	r=(r-1)% QUEUE_SIZE
13.	The situation when in a linked list START=NULL is ....
Option A:	Underflow
Option B:	Overflow
Option C:	Houseful
Option D:	Saturated
14.	Which of the following best describes the topological order?

Option A:	If a digraph has no directed cycle it does have a topological order otherwise it might or might not have a topological order
Option B:	If a digraph has at least one directed cycle it has no topological order otherwise it might or might not have a topological order
Option C:	A directed graph has a topological order if and only if it has no directed cycle
Option D:	None of these
15.	Which of the following statements are correct about a binary tree?
Option A:	A node in a binary tree can have exactly two children.
Option B:	A node in a binary tree can have at most two children.
Option C:	A node in a binary tree can have two or more children.
Option D:	A node in a binary tree can have more than one root.
16.	Which of the following is TRUE about the leaf nodes of a binary tree?
Option A:	Leaf nodes in a binary tree have no children.
Option B:	At least one leaf node in a binary tree has two children.
Option C:	Leaf nodes in a binary tree are allowed to have more than two children.
Option D:	Leaf nodes in a binary tree may or may not have child nodes.
17.	Breadth First Traversal of a tree can be used for _____.
Option A:	Finding the shortest distance to every other node from the root in the tree.
Option B:	Finding cycles in the tree
Option C:	Finding strongly connected components in the tree
Option D:	None of the mentioned
18.	Which of this best describes an array?
Option A:	A data structure that shows a hierarchical behavior
Option B:	Container of objects of similar types
Option C:	Container of objects of mixed types.
Option D:	All the mentioned
19.	You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?
Option A:	Delete the first element
Option B:	Insert a new element as a first element
Option C:	Delete the last element of the list
Option D:	Add a new element at the end of the list
20.	Stacks can be implemented using _____ and _____ ?
Option A:	Array and Binary tree
Option B:	Linked list and Graph
Option C:	Array and Linked list
Option D:	Array and Graph

Please use either of the 3 option given below while setting up the subjective/descriptive questions

Option 1

Q2 and Q3. (20 Marks Each)	**Solve any Four out of Six** **5 marks each** ***Please delete the instruction shown in front of every sub question***
A	What is data structure? Explain various types of data structure.
B	Describe abstract data type with example.
C	Write an algorithm for in-order traversal of a binary tree.
D	Explain the method of representing graphs?
E	Write the conditions to place a new node on a list.
F	Write a program in C for Linear Search

Option 2

Q2 and Q3. (20 Marks Each)	**Solve any Two Questions out of Three** **10 marks each** ***Please delete the instruction shown in front of every sub question***
A	Explain circular queue? Write an program in C to insert and delete an element from a circular queue.
B	Explain Huffman's algorithm with example.
C	What is Hashing? What are different resolving techniques.

Option 3

Q2 and Q3. (20 Marks Each)	***Please delete the instruction shown in front of every sub question***
A	**Solve any Two** **5 marks each**
i.	Explain Expression tree.
ii.	Write program in C to insert a element in middle of singly-linked list.
iii.	What is queue? Why it is known as FIFO? Write an algorithm to insert and delete an element from a simple queue.
B	**Solve any One** **10 mark each**
i.	Write a non-recursive program in C for binary search.
ii.	Write a program to generate a list in ascending order for any given BST.