BRAINWARE UNIVERSITY
Term End Examination 2020 - 21
Programme – Bachelor of Science (Honours) in Computer Science
Course Name – Data Structures
Course Code - BCSC102
Semester / Year - Semester I

Time allotted : 75 Minutes   Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)   1 x 60=60

1.   *(Answer any Sixty)*

(i) Which if the following is/are the levels of implementation of data structure

a) Application level   b) Abstract level

c) Implementation level   d) All of these

(ii) Finding the location of a given item in a collection of items is called ……

a) Discovering   b) Finding

c) Searching   d) Mining

(iii) The operation of processing each element in the list is known as

a) Sorting   b) Merging

c) Inserting   d) Traversal

(iv) Finding the location of the element with a given value is:

a) Traversal   b) Search

c) Sort   d) None of these

(v) An array is a _____ data structure.

a) Linear   b) Non Linear

c) Triangular   d) None of these

(vi) Stack is also called as

    a) Last In First Out   b) First In Last Out

    c) Last in Last Out   d) None of these

(vii) _____ is very useful in situations when data have to stored and then retrieved in reverse order.

    a) Stack   b) Queue

    c) List   d) Link list

(viii) …………. Is a pile in which items are added at one end and removed from the other.

    a) Queue   b) Stack

    c) List   d) None of these

(ix) Which data structure allows deleting data elements from and inserting at rear?

    a) Stacks   b) Queue

    c) List   d) None of these

(x) Which of the following data structure can't store the non-homogeneous data elements?

    a) Arrays   b) Records

    c) Pointers   d) Stacks

(xi) A _____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

    a) Stacks linked list   b) Queue linked list

    c) Both Stacks linked list & Queue linked   d) Neither of them
    list

(xii) The best data structure to evaluate an arithmetic expression (in postfix form) is

a) Queue   b) Stack

c) Tree   d) Linked list

(xiii) What is the value of the postfix expression 6 3 2 4 + – *:

a) 18   b) 15

c) 0   d) 12

(xiv) A normal queue, if implemented using an array of size MAX_SIZE, gets full when

a) Rear = MAX_SIZE – 1   b) Front = (rear + 1)mod MAX_SIZE

c) Front = rear + 1   d) Rear = front

(xv) Queues serve major role in _____

a) Simulation of recursion   b) Simulation of arbitrary linked list

c) Simulation of limited resource allocation d) Simulation of heap sort

(xvi) 6, 8, 4, 3, and 1 are inserted into a data structure in that order. An item is deleted using only a basic data structure operation. If the deleted item is a 1, the data structure cannot be a ?

a) Queue   b) Array

c) Linked List   d) None of these

(xvii) If the array is already sorted, which of these algorithms will exhibit the best performance

a) Merge sort   b) Merge sort

c) Quick ort   d) Bubble Sort

(xviii) What happens when you push a new node onto a stack?

a) The new node is placed at the front of the linked list   b) The new node is placed at the back of the linked list

c) The new node is placed at the middle of the linked list   d) No Changes happens

(xix) The retrieval of items in a stack is ……….. operation.

    a) Push   b) Pop

    c) Retrieval   d) Access

(xx) Which is the pointer associated with the stack?

    a) FIRST   b) FRONT

    c) TOP   d) REAR

(xxi) The elements are removed from a stack in ………. order.

    a) Reverse   b) Hierarchical

    c) Alternative   d) Sequential

(xxii) Deletion operation is done using ……… in a queue.

    a) Front   b) Rear

    c) Top   d) List

(xxiii) Which of the following is an application of stack?

    a) finding factorial   b) tower of Hanoi

    c) infix to postfix   d) All of these

(xxiv) The other name of dequeue is ………

    a) divided queue   b) distributed queue

    c) double ended queue   d) design queue

(xxv) The condition …….. indicate the queue is empty.

    a) Front=Null   b) Null=Front

    c) Front=Rear   d) Rear=Null

(xxvi) The value of REAR is increased by 1 when …….

a) An element is deleted in a queue   b) An element is traversed in a queue

c) An element is added in a queue   d) An element is merged in a queue

(xxvii) Which of the following data structure is non linear?

a) Strings   b) Lists

c) Stacks   d) Graph

(xxviii) The process of accessing data stored in a serial access memory is similar to manipulating data on a

a) heap   b) queue

c) stack   d) binary tree

(xxix) Linked lists are best suited

a) for relatively permanent collections of data   b) for the size of the structure and the data in the structure are constantly changing

c) both for relatively permanent collections of data & for the size of the structure and the data in the structure are constantly changing   d) for none of above situation

(xxx) Which of the following data structure is linear type?

a) Strings   b) Lists

c) Queues   d) All of these

(xxxi) The data structure required to check whether an expression contains balanced parenthesis is?

a) Stack   b) Queue

c) Array   d) Trees

(xxxii) Which data structure is needed to convert infix notation to postfix notation?

a) Branch   b) Tree

c) Queue   d) Stack

(xxxiii) Which data structure is used for implementing recursion?

a) Stack   b) Branch

c) Tree   d) Queue

(xxxiv) In a circular linked list

a) Components are all linked together in   b) There is no beginning and no end.
some sequential manner.

c) Components are arranged hierarchically.   d) Forward and backward traversal within
                                                the list is permitted.

(xxxv) A linear list of elements in which deletion can be done from one end
(front) and insertion can take place only at the other end (rear) is known as a ?

a) Queue   b) Stack

c) Tree   d) Linked list

(xxxvi) Items in a priority queue are entered in a _____ order

a) Random   b) order of priority

c) as and when they come   d) None of these

(xxxvii) A line in a grocery store represents a

a) stack   b) queue

c) linked list   d) array

(xxxviii) The list data structure can be defined recursively.

a) all time   b) never

c) some time   d) None of these

(xxxix) Which of the following is a disadvantage of linear search?

a) Requires more space   b) Greater time complexities compared to

other searching algorithms

c) Not easy to understand d) Not easy to implement

(xl) To obtain a prefix expression, which of the tree traversals is used?

a) Level-order traversal b) Pre-order traversal

c) Post-order traversal d) In-order traversal

(xli) Degree of a leaf node is

a) 0 b) 1

c) 2 d) 3

(xlii) Which of the following traversal techniques lists the elements of a binary search tree in ascending order?

a) Pre-order b) Post-order

c) Inorder d) None of these

(xliii) Which of the following ways is a post-order traversal?

a) Root->left sub tree-> right sub tree b) Root->right sub tree-> left sub tree

c) right sub tree-> left sub tree->Root d) left sub tree-> right sub tree->Root

(xliv) The number of edges from the node to the deepest leaf is called _____ of the tree.

a) Height b) Depth

c) Length d) Width

(xlv) What is a full binary tree?

a) Each node has exactly zero or two children b) Each node has exactly two children

c) All the leaves are at the same level d) Each node has exactly one or two children

(xlvi) Which of the following is not an advantage of trees?

a) Hierarchical structure

b) Faster search

c) Router algorithms

d) Undo/Redo operations in a notepad

(xlvii) In a full binary tree if number of internal nodes is I, then numbers of leaves L are?

a) L = 2*I

b) L = I + 1

c) L = I – 1

d) L = 2*I – 1

(xlviii) In a full binary tree if number of internal nodes is I, then numbers of nodes N are?

a) L = 2*I

b) L = I + 1

c) L = I – 1

d) L = 2*I + 1

(xlix) In a full binary tree if there are L leaves, then total numbers of nodes N are?

a) N = 2*L

b) N = L + 1

c) N = L – 1

d) N = 2*L– 1

(l) The height of a BST is given as h. Consider the height of the tree as the no. of edges in the longest path from root to the leaf. The maximum no. of nodes possible in the tree is?

a) 2h-1 -1

b) 2h+1 -1

c) 2h +1

d) 2h-1 +1

(li) The no of external nodes in a full binary tree with n internal nodes is?

a) 1

b) n

c) n+1

d) 2n

(lii) If a node having two children is to be deleted from binary search tree, it is replaced by its

a) In-order predecessor

b) In-order successor

c) Pre-order predecessor   d) None

(liii) In a full binary tree, every internal node has exactly two children. A full binary tree with 2n+1 nodes contains

a) n leaf node   b) n internal nodes

c) n-1 leaf nodes   d) n-1 internal nodes

(liv) In which of the following tree, parent node has a key value greater than or equal to the key value of both of its children?

a) Binary search tree   b) Threaded binary tree

c) Complete binary tree   d) Max-heap

(lv) A complete binary tree of level 5 has how many nodes?

a) 15   b) 25

c) 63   d) 30

(lvi) The depth of a complete binary tree with 'n nodes is (log is to be base two)

a) log (n+1)-1   b) log(n)

c) log (n-1) + 1   d) log(n) + 1

(lvii) For finding a node in a ……………………, at each stage we ideally reduce the number of nodes we have to check by half.

a) binary tree   b) binary search tree

c) AVL tree   d) binary heap tree

(lviii) Any node is the path from the root to the node is called

a) Successor node   b) Ancestor node

c) Internal node   d) None of these

(lix) …………………. Is a directed tree in which out degree of each node is less than or equal to two.

a) Unary tree   b) Binary tree

c) Trinary tree   d) Both Binary tree & Trinary tree

(lx) The in order traversal of tree will yield a sorted listing of elements of tree in

a) Binary trees   b) Binary search trees

c) Heaps   d) None of these