BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – BCA-2018
Course Name – Data Structures
Course Code - BCA201
(Semester II)

Full Marks : 70   Time : 3:0 Hours

[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 15=15

1. Choose the correct alternative from the following :

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

   a) Height   b) Depth
   c) Length   d) Width

(ii) 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 The number of the node in the left sub-tree and right sub-tree of the root, respectively, is

   a) (4, 7)   b) (7, 4)
   c) (8, 3)   d) (3, 8)

(iii) To represent hierarchical relationship between elements, Which data structure is suitable?

   a) Dequeue   b) Priority queue
   c) Tree   d) Graph

(iv) Inserting an item into the stack when the stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called _____ operation.

   a) push, pop   b) Pop, push
   c) insert, delete   d) delete, insert,

(v) Which of the following is the level of implementation of data structure?

   a) Application level   b) Abstract level
   c) Implementation level   d) All of these

(vi) _____ 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

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(vii) 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 of them
d) Neither of them

(viii) How is Data in a queue accessed?

a) First in First out
b) First in Last out
c) Last in First out
d) Last in Last out

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

a) Merge sort
b) Quick Sort
c) Insertion sort
d) None of these

(x) The retrieval of items in a stack is _____ operation.

a) Push
b) Pop
c) Retrieval
d) Access

(xi) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?

a) ABCD
b) DCBA
c) DCAB
d) ABDC

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

a) Branch
b) Tree
c) Queue
d) Stack

(xiii) Which Data Structure is used to perform Recursion?

a) Queue
b) Stack
c) Tree
d) Linked list

(xiv) 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?

a) Delete the first element
b) Insert a new element as a first element
c) Delete the last element of the list
d) Add a new element at the end of the list

(xv) Which of the following is a correct way to declare a multidimensional array in Java?

a) int[] arr;
b) int arr[[]];
c) int[][]arr;
d) int[[]] arr;

Group-B
(Short Answer Type Questions)

3 x 5=15

2. Write down difference between full binary tree and complete binary tree. (3)
3. What is sorting? Define any sorting with example. (3)
4. Write an algorithm for Linear Search of an array. (3)
5. What is the length of the path in a tree? (3)
6. Explain the representations of priority queue (3)

OR

Differentiate STACK from ARRAY. (3)

Group-C
(Long Answer Type Questions)

5 x 8=40

7. State the advantages of circular lists over doubly linked list. (5)
8. Compare quick sort and merge sort. (5)
9. Mention the different ways to select a pivot element. (5)

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10. Why Shell Sort is known diminishing increment sort? (5)
11. What is Extendible Hashing? (5)
12. Why is the linked list used for polynomial arithmetic? (5)
13. Define a heap. How can it be used to represent a priority queue? (5)
14. What is the main idea behind the selection sort? (5)

OR

What is linear search? (5)

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