Registration No:

Total Number of Pages : 3   B.TECH

2ⁿᵈ Semester Regular Examination-April-May 2019
BBSES2050 - DATA STRUCTURE USING 'C++'
(Regulations 2018) Common to All Branches

Time : 3 Hours   Maximum : 100 Marks

Answer ALL Questions
The figures in the right hand margin indicate marks.
PART – A: (Multiple Choice Questions) 10 x 2=20 Mark

Q.1. Answer _All_ Questions.

a. Consider following code: [CO1]
   #include<iostream.h>   [PO2]
   int main()
   { int a[10];
   A[0]=10; A[1]=4; A[3]=15;
   cout<<A[2+1];
   }
   What will be the output of following code?
   a) Compilation Error   b) 10   c) 4   d) 15

b. A _____ data structure is linear list in which all insertion are made at the rear-end   [CO1]
   of list and deletion are made at the front-end of the list.   [PO1]
   a) Stack   b) Queue   c) Dequeue   d) Array

c. The postfix expression for the infix expression : a+b*c/d   [CO1]
   a) abc*d/+   b) a*bcd/+   c) ab*cd/+   d) abcd*/+   [PO2]

d. A _____search begins the search with the element that is located in the middle of array.   [CO2]
   a) Sequential   b) Random c) Parallel d) Binary   [PO1]

e. A linked list in which last node contain the link of the first node is called   [CO2]
   a) Singly linked list   b) Doubly linked list c) Circular linked list d) All of the above   [PO1]

f. Which of the following traversal techniques lists the nodes of a binary search tree in   [CO3]
   ascending order?   [PO1]
   a) Post-order b) In-order c) Pre-order d) None of the above

g. The following Tree is _____.   [CO3]
                                                                                                     [PO2]
```
              55
             /  \
           17    60
          / \   /  \
        5 20  42  105
          / \   \
         3  9   56
```
   a) Binary Search Tree   b) Full Binary Tree c) Complete Binary Tree d) Binary Tree

h. Heap can be used as _____   [CO4]
   a) Priority Queue n b) Stack c) Array d) Graph   [PO1]

i. Which of the following ways can be used to represent a graph?   [CO4]
   a) Adjacency List and Adjacency Matrix   b) Incidence Matrix   c) Adjacency List,   [PO1]
   Adjacency Matrix and Incidence Matrix   d) Adjacency List, Incidence Matrix

j. In _____, all keys are stored in the hash table itself without the use of linked lists.   [CO4]
   a. Open Hashing   b. Open addressing c. Closed Hashing   d. Rehashing   [PO1]

PART – B: (Short Answer Questions) 10x2=20 Marks

Q.2. Answer _ALL_ questions

a	Define Stack and list the applications of Stack.	[CO1] [PO1]
b	What is Double Ended Queue?	[CO1] [PO1]
c	Differentiate between Linear Search and Binary Search.	[CO2] [PO1]
d	Write a short note on the Bucket Sort.	[CO2] [PO1]
e	Illustrate about the disadvantages of Singly Linked List.	[CO2] [PO1]
f	How to represent a Binary Tree using Linked List?	[CO3] [PO1]
g	What is the purpose of AVL Tree?	[CO3] [PO1]
h	Define Min-heap.	[CO4] [PO1]
i	Draw the Complete Undirected Graph on five vertices.	[CO4] [PO1]
j	Write about Hashing Function.	[CO4] [PO1]

PART – C: (Long Answer Questions) 4x15 =60 Marks

Answer _ALL_ questions

Q.3

a.	Illustrate about Memory Representations of 1-Dimentional and 2-Dimentional Arrays.	9M	[CO1] [PO1]
b.	Write a C++ program to implement Stack Operations using arrays.	6M	[CO1] [PO2]

OR

c.	What is a Circular Queue? and briefly explain the basic operations of Circular Queue.	9M	[CO1] [PO1]
d.	Evaluate the Postfix Expression ab+cd/e*f%- using Stack. The values of the variables are a=2, b=3, c=5, d=2, e=4 and f=6.	6M	[CO1] [PO2]

Q.4

|			
a.	Compare Singly Linked List with Circular Linked List.	5M	[CO2] [PO1]
b.	Sort the following elements using Quick Sort 54, 26, 93, 17, 77, 31, 44, 55, 20.	10M	[CO2] [PO2]

OR

c.	Write a C++ code for Bubble Sort using linear arrays.	5M	[CO2] [PO2]
d.	Describe any two operations on Doubly Linked List.	10M	[CO2] [PO1]

Q.5

a. Write about representation of Binary Tree using Linked List. Represent the following Binary Tree using linked list representation.   [CO3] [PO2]

Binary Tree

7M
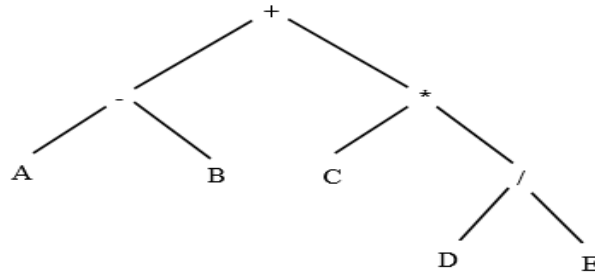
b. Explain different Rotation Patterns for balancing AVL trees with respect to Insertion operation of a data node   8M   [CO3] [PO1]

OR

c. Construct a Binary Tree using the following tree traversals.
Inorder: D B H E A I F J C G,   Preorder: A B D E H C F I J G   7M   [CO3] [PO2]

d. What is Binary Search Tree? What operations that can be performed on BST? explain.   8M   [CO3] [PO1]

Q.6

a. What is Binary Heap? Explain Max binary heap with an example.   7M   [CO4] [PO2]

b. Discuss about DFS and BFS graph traversal with an example.   8M   [CO4] [PO1]

OR

c. Outline about a Single Source Shortest Path algorithm (Dijkstra'a algorithm).   7M   [CO4] [PO1]

d. Distinguish between Separate Chaining and Open Addressing.   8M   [CO4] [PO1]

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