Seat No:_____ Enrollment No:_____

PARUL UNIVERSITY

FACULTY OF IT & COMPUTER SCIENCE

BCA / IMCA Winter 2019 – 20 Examination

Semester: 2 **Date: 10/ 12/ 2019**

Subject Code: 05101152 / 05301152 **Time: 10:30 AM to 01:00 PM**

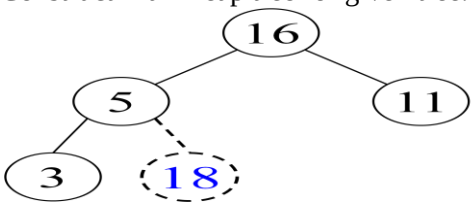
Subject Name: Data Structures **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A. Answer the followings. **(05)**

1. Define Data Structure? List any two application of Data Structure.
2. What is Time Complexity?
3. What is queue? Queue working on which principle.
4. What is Undirected graph? Give one example.
5. Construct Max Heap tree for given tree.



Q.1 B. Multiple choice type questions. **(10)**

1. If several elements are competing for the same bucket in the hash table, what is it called?
   A) Diffusion B) Replication
   C) Collision D) None of the mentioned

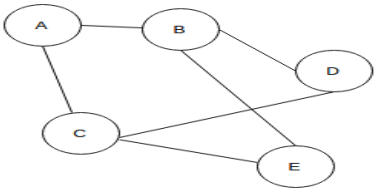
2. The essential condition which is checked before deletion in a linked queue is?
   A) Underflow B) Overflow
   C) Front value D) Rear value

3. What is the value of the postfix expression 6 3 2 2 + – *:
   A) Something between -5 and -15 B) Something between 5 and -5
   C) Something between 5 and 15 D) Something between 15 and 100

4. Assuming int is of 4bytes, what is the size of int arr [15]?
   A) 15 B) 19 C) 11 D) 60

5. What is the result of the following operation **Top (Push (S, X))**
   A) X B) null
   C) S D) None of these.

6. Find the degree of the vertex A in given graph



   A) 1 B) 2
   C) 3 D) 0

7. The data structure required for Breadth First Traversal on a graph is
   A) queue B) stack
   C) array D) tree

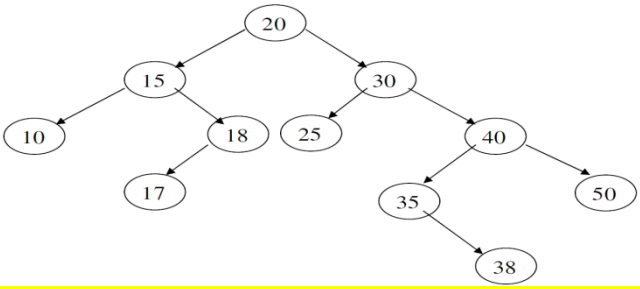
8. The searching technique that takes O (1) time to find a data is
   A) Linear Search B) Binary Search
   C) Hashing D) Tree Search

9. A BST is traversed in the following order recursively: Right, root, left
The output sequence will be in
A) Ascending order B) Descending order
C) Bitomic sequence D) No specific order

10. What will be the output after performing these sequence of operations
push(5);
push(20);
top();
pop();
top();
A) 20 B) 4
C) stack underflow D) 5

Q.2 Answer the followings. (Any Five) **(15)**

1. Traverse the below binary tree in Preorder, Inorder and postorder.



2. Define graph. Explain the representation of graph with suitable example.

3. Construct max heap tree 8, 20, 9, 4, 15, 10, 7, 22, 3, 12

4. Write a Short note on sparse matrix with suitable example.

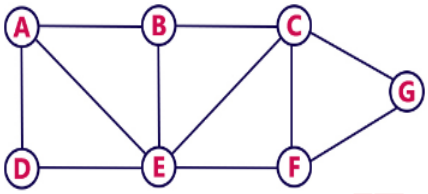
5. What is stack? Explain POP operation with Algorithm.

6. What is Binary Tree? Explain Types of Binary Tree.

Q.3 Answer the following. (Any three) **(15)**

1. What is Link list? Explain insertion of element at the end of the link list with algorithm.

2. Consider the following example graph to perform DFS traversal



3. What is circular queue? Write algorithm/ program to insert and delete and element from Circular queue (Array Implementation)?

4. What is file organization? List the different file organization technique and explain any one in detail.

Q.4 Answer the following.

A. Construct AVL Tree for given set 15, 20, 24, 10, 13, 7, 30, 36, 25 **(05)**

B.
1) Explain selection sort algorithm in detail. Solve the following example. **(5)**
23, 20, 11, 89, 69, 3, 56, 5, 45, 40
2) Convert the given expression into postfix expression using algorithm steps: **(5)**
A+(B*C-(D/E^F)*G)*H

OR

B.
1) Explain Binary Search algorithm in detail. Solve the following example and search 45 element in given data. **(5)**
23, 20, 11, 89, 69, 3, 56, 5, 45, 40
2) Construct B Tree with order 5with given number **(5)**
1 12 8 2 25 6 14 28 17 7 52 16 48 68 3 26 29 53 55 45

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