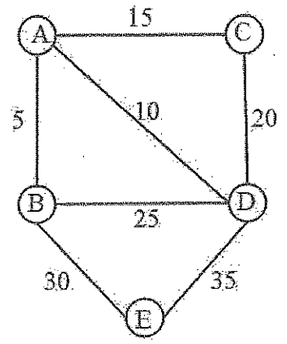
b. Discuss about AVL tress in detail.

31. a. Apply kruskal's algorithm and find the minimum spanning tree for the given graph.



(OR)

b. Explain Dijkstra's shortest path algorithm with an example.

32. a. Discuss the sum of subset problem using backtracking method.

(OR)

b. Write down the divide and conquer algorithm for matrix multiplication with example.

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Reg. No.															

B.Tech. DEGREE EXAMINATION, MAY 2019
3rd to 8th Semester

15CS252J – DATASTRUCTURES AND ALGORITHMS
(For the candidates admitted during the academic year 2015 – 2016 to 2017-2018)

Note:
(i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.
(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer ALL Questions

1. In a queue insertion can take place only at one end called _____.
(A) Rear (B) Front
(C) Bottom (D) Top

2. _____ is the term used to insert an element into a stack.
(A) Pull (B) Push
(C) Bottom (D) Pop

3. The linked field in a node contains
(A) Address of next node (B) Address of previous node
(C) Data of next node (D) Data of current node

4. _____ refers to the situation when one wants to add data into a data structure that is full
(A) Underflow (B) Free space
(C) Overflow (D) Full state

5. Which of the below series is in non-increasing order?
(A) 1,3,4,6,8,9 (B) 9,8,6,4,3,1
(C) 1,3,3,6,8,9 (D) 9,8,6,3,3,1

6. Quick sort running time depends on the selection of
(A) Size of an array (B) Pivot element
(C) Sequence of values (D) Size of the memory

7. Linear arrays are also called _____
(A) One dimensional array (B) Vertical array
(C) Horizontal array (D) Multi-dimensional array

8. The operation of processing each element in the list is known as
(A) Inserting (B) Traversal
(C) Merging (D) Sorting

9. Which of the following condition checks available free space in avail list?
(A) Avail = top (B) Null = avail
(C) Avail = null (D) Avail = max stack

10. The post fix form of $A * B + C / D$ is
    (A) $ABCD + / *$ (B) $AB * CD / +$
    (C) $*AB / CD +$ (D) $A * BC + / D$

11. _____ notation refers to the notation in which the operator symbol is placed before its two operands.
    (A) Prefix (B) Postfix
    (C) Polix (D) Reverse polish

12. A technique for direct search is
    (A) Tree search (B) Binary search
    (C) Hashing (D) Linear search

13. A graph G is _____ if every node x in G is adjacent to every node y in G.
    (A) Spanning (B) Balanced
    (C) Tree (D) Complete

14. Which data structure is suitable to represent hierarchical relationship between elements?
    (A) Graph (B) Tree
    (C) Dequeue (D) Priority

15. Which data structure is used in breadth first search of a graph to hold nodes?
    (A) Stack (B) Queue
    (C) Tree (D) Array

16. A binary search tree whose left subtree and right subtree differ in height by at most 1 unit is called
    (A) AVL tree (B) Red-black tree
    (C) Lemma tree (D) B tree

17. In a expression $AB + C * D /$ if A = 2, B = 3, C = 4, D = 4 then result in a stack is
    (A) 5 (B) 6
    (C) 1/5 (D) 8

18. The complexity of the average case in an algorithm is
    (A) Much more simpler than worst case (B) Much more complicated to analyze than that of average case
    (C) Much more complicated to analyze than that of worst case (D) Much more simpler than best case

19. The quick sort algorithm exploit _____ design technique.
    (A) Divide and conquer (B) Back tracking
    (C) Dynamic programming (D) Greedy

20. An algorithm that calls itself directly or indirectly is known as
    (A) Sub algorithm (B) Recursion
    (C) Polish notation (D) Traversal algorithm

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

21. Compare last in first out with first in first out order in data structures.

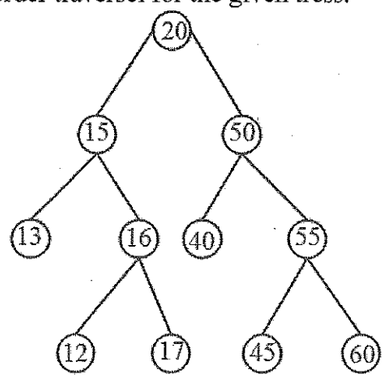
22. Write a note on singly linked list.

23. How deletion operations are performed in a binary tree?

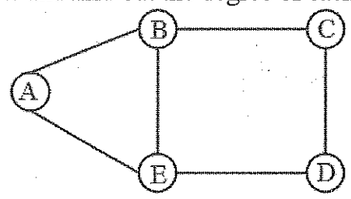
24. Differentiate directed and undirected graph.

25. What is the need of backtracking?

26. Perform pre order and post order traversel for the given tress.



27. Consider the graph given below and find out the degree of each node.



PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

28. a. Define an array. Explain the various operations on arrays with example.

(OR)

b. Discuss about the insertion and deletion algorithm of a queue with an example.

29. a. Write a C program to sort the number using merge sort.

(OR)

b. Write down the procedure for insertion and deletion of a node in a binary search tree.

30. a. Illustrate on open addressing with an example.

(OR)