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EVEN Semester Examination-2023

Paper Name: Introduction to Data Structures

Paper Code: BCA 201 / 13SCCH

Time: 2.5 Hours

Maximum Marks: 60

Note: Mobile Phones or programmable calculator or any equipment with memory are not allowed inside the examination hall.

SECTION: A (20 Marks)

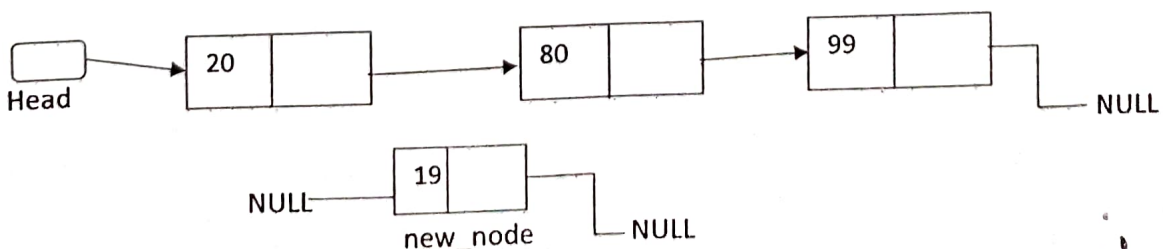
All questions are compulsory (20x1=20)

1. _____ Notation is a method that is used to express upper bound of the running of an algorithm
2. In stack data structure LIFO stands for _____
3. _____ operation is used to insert values in stack
4. Graph is _____ type of data structure
5. _____ will be the inorder of the tree with nodes a1,b1,c1,d1,e1,f1,g1
6. AVL tree is a tree which is also known as _____ binary search tree
7. _____ and _____ are two types of operations on graph
8. _____ will be the output of selection sort with data set 6,5,2,3,0
9. Bucket sort is also known as _____ sort
10. _____ will be the postfix expression of Infix expression $5+10*7/9$
11. _____ is the application of Depth first search (DFS)
12. BFS do not have _____
13. If pop operation is performed on empty stack, then the condition is known as _____
14. Queue is a linear data structure in which items are inserted at one end called _____ and deleted from other end called _____
15. A node in a tree which do not have child is known as _____
16. _____ is the maximum number of level of a node in a tree
17. Balance factor is _____ - _____
18. _____ is the efficiency of linear search
19. Linked list are used in situations where there is a need for _____ memory allocation
20. _____ is the application area of graphs

SECTION-B (4x5=20 Marks)

Attempt any FOUR Questions.

1. Write a program in C to insert a node at the beginning of a linked list



Moderated

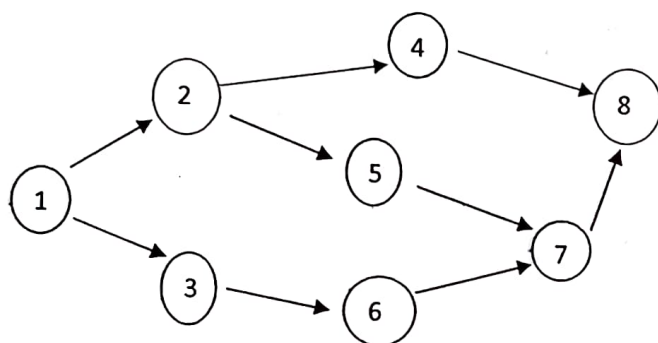
2. Write a program to perform bubble in C and perform bubble sort on the following data
3,0,9,23,5,39,60,2,15
3. What is an asymptotic notation? Explain the various types of asymptotic notation with help of example
4. The content of stack S are as follows, perform following Operations
 - a) Push (S,11)
 - b) Push (S,98)
 - c) Pop (S)
 - d) Pop (S)
 - e) Pop (S)
 - f) Push (S,-2)
 - g) Push (S,54)

Indicate position of TOP pointer after each of the above stack operations.

Stack (S)	99	1	40	7				
Index	0	1	2	3	4	5	6	7

↑
TOP

5. Write a algorithm and program in C to delete a value from an array
6. What is a graph and adjacency matrix? Generate BFS and DFS traversal sequence of graph



SECTION-C (2x10=20 Marks)
Attempt any TWO Questions.

1. Differentiate between Breadth first search (BFS) and Depth first Search (DFS). 10 points
2. Deduce the omega notation if $f(n) = 2n^2 + 6$ and $g(n) = 6n$
3. Write a program in C using structure (Travel_details) and display following information of 5 passengers
 - a) Source
 - b) Destination
 - c) passenger_name
 - d) age
 - e) mobile_number
 - f) Train_name