KONERU LAKSHMAIAH EDUCATION FOUNDATION
(Deemed to be University, Estd. u/s. 3 of UGC Act 1956)

B.Tech - Even Sem : Semester in Exam-I
Academic Year:2021-2022

21SC1202 - DATA STRUCTURES

Set No: 2

Time:		**Max.Marks: 50**					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	Consider an array is already in sorted order, justify your answer to prove that best case running time of insertion sort is O(N) with an example?	choice Q-2		4.5Marks	CO1	4	4
2.	Find the asymptotic relation of the following time complexities? a. $F(n) = 2^{n+1}$ b. $G(n) = 1.5^{n/2}$ c. $H(n) = 2^{2n}$			4.5Marks	CO1	4	4
3.	Alexa is working as teacher in Little Angels school and 9 kids are studying LKG. Alexa assigned new names to the kids as first letter of their names [‘N’, ‘B’, ‘S’, ‘H’, ‘C’, ‘D’, ‘T’, ‘M’, ‘L’]. Help Alexa to arrange the kids in alphabetical order by implementing quick sort using a C program?	choice Q-4		8Marks	CO1	4	4
4.	Arrange the following sequence of numbers 23, 12, 7, 3, 9, 15, 5, 10, 4, 12, 6, 12 in ascending order using bucket sort where bucket size is 23?			8Marks	CO1	4	4
5.	Write a C program to implement insertion sort to arrange the given list in descending order. Trace that program with the list of integers 34, -21, 82, 54, 72, -57, 40, -63. Display the order of values and number of comparisons after every iteration.	choice Q-6		12.5Marks	CO1	4	4
6.	Given an array of real numbers [123.45, 87.0, 456.17, 56.39, 98.42, 95.76, 64.28, 287.86], arrange them in descending order using merge sort. Display the values and number of comparisons after every iteration and derive the worst-case time complexity of merge sort technique?			12.5Marks	CO1	4	4
7.	Write a function to delete a node at the given position in doubly lined list?	choice Q-8		4.5Marks	CO2	4	4
8.	Write a function to find maximum element in an circular linked list?			4.5Marks	CO2	4	4
9.	Neha went to her native village and sat under a tree, looked at a temple and remembered his young age days. A set of 6 boys and himself played human train (catching the shirt at back one after another) in her village and dropped one by one from the front near that temple. Simulate this real time situation with an implementation of queue using single linked list?	choice Q-10		8Marks	CO2	4	4
10.	show the detailed contents of stack to convert the given infix expression into postfix expression (A -			8Marks	CO2	4	4

	B)+ (C + D) ^ ((F ^ D) * E). Assume that the order of precedence (from highest to lowest) is ^, /, *, +, -.						
11.	Given an empty stack S and an empty queue Q. Do the following operations and show the detailed contents of stack and queue. a. Push an element 25 into stack b. Push an element 31 into stack c. Push an element 24 into stack c. Pop top of the stack and enqueue it into queue d. Push an element 29 into stack e. Display top of the stack f. Pop top of the stack and enqueue it into queue g. Pop top of the stack and enqueue it into queue h. Display queue i. Dequeue an element from queue and push it into stack j. Display top of the stack	choice Q-12		12.5Marks	CO2	4	4
12.	The University of Massachusetts is storing and organizing students records with the data Sname (Student Name), SRNo (Student Roll Number), Age, Percentage using singly linked list. a. Give the node structure to define student record b. Display the student details whose percentage is greater than 85. c. Insert newly joined student record at the end d. Delete the last student record			12.5Marks	CO2	4	4

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