NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA THEORY EXAMINATION

Question Paper

Month and year: May, 2018 Program: B.Tech.-IT Subject: Data structure

Maximum Marks: 50

Number of Questions to be attempted: 5

Total no. of pages used: 2

Semester: II

Course code: ITPC-12

Time allowed: 03 Hours

Total No of Questions: 8

Note 1: Section A is compulsory and Attempt any two from Section B and any two from section C. Do each parts of a question at a place.

Note 2: Unless stated otherwise, the symbols have their usual meanings in context with subject. Assume suitably and state, additional data required, if any.

	SECTION-A	
Q-1.	(a) Differentiate between dangling pointer and wild pointer.	2
	(b) What is doubly ended queue (DEQueue)?	2
Email Print	(c) Compare and contrast singly linked list and doubly linked list.	2
	(d) What is the max heap? Show it with an example.	2
LIGHT S	(e) What is an extended binary tree? Illustrate with an example.	2
2016	SECTION-B	
Q-2.	(a) What is the difference between a heap and binary search tree? Obtain heap and binary	5
	tree for following data set: 45, 56, 78, 23, 11, 54, 88, 43, 55, 21, 67.	
	(b) Write a program to create a circular linked list and C function to delete its middle	5
	element in a single traversal. Also, deletion complexity.	
Q-3.	(a) Differentiate between malloc and calloc.	2
	(b) WAP to implement the stack using a linked list with its push and pop function.	4
	(c) Write insertion and deletion function of the circular queue using an array.	4
Q4.	(a) A binary tree has 9 nodes. The in-order and pre-order traversal of tree yields the following sequence of nodes. Draw the tree and also write its step. In-order: E A C I F H D B G Pre-order: F A E I C D H G B	4
	(b) WAP to create a max heap. Analyze the complexity of max heap.	6
	SECTION-C	
	O: WAP in C. language to reverse event group of it pures in a pley	
Q5.	(a) WAP of reversal of singly linked list using any number of variables.	5
	(b) Write a C function of inserting an element in a binary search tree at the node having	5
	one child or no child.	

Q6.	(a) Write the non-recursive C function for pre-order traversal of a binary tree.	6
Qu.	(b) WAP to create a doubly linked list of n elements. Also, write a function to delete even places	6
Q-7.	elements. (a) Write the C program for sorting the list of integers using quick sort algorithm. Obtain the worst case and average case time complexity of this algorithm. Show the trace of an algorithm for case and average case time complexity of this algorithm. Show the trace of an algorithm for case and average case time complexity of this algorithm.	6
THE STATE OF	following the key sequence: 62, 22, 36, 6, 79, 26, 75, 13, 57, 13, 57, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15	4
	expression using the algorithm AB+CD/AB-EA/(1) where 17 2,0	91
Q-8	(a) What is a DEQueue? Give an option between a linear array and circular array, which one will you choose to implement DEQueue. Justify your answer.	5
	(b) Write an algorithm to merge two circular linked lists, A and B, to produce a resultant circular linked list C.	5
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	(a). WAP of reversal of slogily linked the verous any consists of storagles. (ii) Write all function of inserting as closes as in interest and in order to make horse.	
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