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.

Q-1.	SECTION-A (a) Differentiate between dangling pointer and wild pointer.	2
Q-1.	(a) Differentiate between danging pointer and wild pointer.	2
	(b) What is doubly ended queue (DEQueue)?	2
Total	(c) Compare and contrast singly linked list and doubly linked list.	2
The	(d) What is the max heap? Show it with an example.	2
1716	(e) What is an extended binary tree? Illustrate with an example.	2
title	SECTION-B	
2-2.	(a) What is the difference between a heap and binary search tree? Obtain heap and bina tree for following data set: 45, 56, 78, 23, 11, 54, 88, 43, 55, 21, 67.	ry 5
	(b) Write a program to create a circular linked list and C function to delete its middle element in a single traversal. Also, deletion complexity.	5
2-3.	(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
24.	(a) A binary tree has 9 nodes. The in-order and pre-order traversal of tree yields 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	
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 one child or no child.	5

. Q6.		(a) Write the non-recursive C function for pre-order traversal of a binary tree.
Qu.		(b) WAP to create a doubly linked list of n elements. Also, write a function to delete even places elements.
Q-	7.	(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 following the key sequence: 62, 22, 36, 6, 79, 26, 75, 13, 31, 76.
199		(b) Write an algorithm for evaluating a postfix expression and evaluate the following postfix expression using the algorithm AB+CD/AD-EA∧ + * where A=2, B=7, C=9, D=3, E=5.
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.
		(b) Write an algorithm to merge two circular linked lists, A and B, to produce a resultant circular linked list C.
1 20		AC bridge is taxed for a manifest the bridge, under bridge condition. A par-
		in parameter is muchas or the product of supplied (G) mouth bolis (losion of using the
,		
5 40 5		
3 (0) 2		in working principle, did to a sensitive and also draw the equivalent draws and
	h	
4		
i e (a)	West	
	and a	estati increal teresia colore de la colore dela colore de la colore de la colore de la colore de la colore dela colore de la colore dela colore de la colore de la colore de la colore de la colore dela colore de la colore dela col
		maning being good and it your despite provide the about a source of the control of the whole
122 (27)		mount of on 1 SB #528 Assessed at 25 Management the president of LVD Labour to
		California in a fate of the control
		THE STATE OF THE S
		ase the restriction of the instrument in their
		AND
0.7 (2)		the classified too the train of the thin bearing a final analysis in the manner of the too. Cave is
		(c) Write insertion and deletion function of the curvatar quarte using an array
askal		the the trace of Scran anger? He has placed the man than the property of the trace of the second sec
		and the state of t
		The course described as the proposition work of the first state of the course of the c
		The second of the value of the value of the second of the second of the value of the second of the s
		by W.A.P. to create a max heap. Assigned the comments the properties are a second or PAW. (d)
		O-MOLT 398
		(a) WAP of reversal of slogly finited tist using any nomber of variables.
		graved state on its west flowers wished a statement in a pintre of flow at the market may