Scheme of Valuation/Answer Key

(Scheme of evaluation (marks in brackets) and answers of problems/key)

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION(S), MAY2019

Course Code: CS205

Course Name: DATA STRUCTURES (CS,IT)

Max. Marks: 100		Duration: 3 Hours

PART A

		Answer all questions, each carries3 marks.	Marks
1		Each definition – 1 mark each (3 * 1 =3)	(3)
2		Comparison – pointing out atleast 3 differences	(3)
3		Row major order representation – 1.5 marks Column major order representation – 1.5 marks	(3)
4		Algorithm	(3)

PART B

Answer any two full questions, each carries9 marks.

5	a)	Definition – 1 mark Essential properties – ▪ must have a base case which can be solved without recursion ▪ recursive call should progress towards base case – 3 marks	(4)
	b)	Recursive function - 4 marks Time Complexity – O(n) - 1 mark	(5)
6		(i) Algorithm to insert a node with data ‘y’ after a node whose data is ‘x’. (ii) Algorithm to delete a node whose data is ‘s’ . (iii) Algorithm to insert a node with data ‘a’ as the 1st node of the list.	(3) (3) (3)
7	a)	explanation	(3)
	b)	Algorithm	(6)

PART C			
Answer all questions, each carries3 marks.			
8		Algorithm	(3)
9		Disadvantages- Queue full condition does not necessarily mean that the queue is full – 1 mark Overcome – After each Enqueue operation, shift the elements towards front (or) Treat the queue as circular – 2 marks	(3)
10		Definition of Tree – 1.5 marks ; Definition of Binary Tree – 1.5 marks	(3)
11		Diagram	(3)
PART D			
Answer any two full questions, each carries9 marks.			
12	a)	• BST definition 1 mark • Example 2 marks	(3)
	b)	Algorithm for Push – 3 marks; Algorithm for Pop – 3 marks;	(6)
13		Algorithm – 5 marks Trace on the given input – 4 marks	(9)
14	a)	Algorithm	(4)
	b)	Iterative/Non Recursive algorithm for Inorder Traversal of a Binary Tree	(5)
PART E			
Answer any four full questions, each carries10 marks.			
15	a)	(i) Adjacency Matrix with advantages and disadvantages – 3 marks (ii) Adjacency List with advantages and disadvantages – 3 marks	(6)
	b)	Algorithm	(4)
16	a)	Algorithm for DFS – 3 marks; Algorithm for BFS – 3 marks	(6)
	b)	Output of DFS traversal – 2 marks; Output of BFS traversal – 2 marks;	(4)
17	a)	Algorithm for Quick Sort	(5)
	b)	Trace the working showing the partitioned array after each call.	(5)
18	a)	Comparison listing atleast 3 differences	(3)
	b)	Algorithm - 4 marks	

		Trace the algorithm on given input (show the values of beg, end and mid after each iteration) – 3 marks	(7)
19	a)	Collision – 1 mark; Example – 1 mark	(2)
	b)	Division Method with an example – 2marks Midsquare Method with an example – 2marks Folding Method with an example – 2marks Digit Analysis Method with an example – 2marks	(8)
20		h(x) = x mod 7 2341 mod 7 = 3 4234 mod 7 = 6 2839 mod 7 = 4 430 mod 7 = 3 22 mod 7 = 1 397 mod 7 = 5 3920 mod 7 = 0 - 2 marks (i) Separate Chaining 0 [3920] 1 [22] 2 [ ] 3 [2341, 430] 4 [2839] 5 [397] 6 [4234] - 2 marks (ii) Linear probing 0 [397] 1 [22] 2 [3920] 3 [2341] 4 [2839] 5 [430] 6 [4234] - 2 marks (iii) quadriatic probing 0 [430] 1 [22] 2 [3920] 3 [2341] 4 [2839] 5 [397] 6 [4234] - 4 marks **430 collides at 3:** $3+1^2 = 4$ $3+2^2 = 3+4 = 7 \% 7 = 0$ **3920 collides at 0**: $0+1^2 = 1$ $0+2^2 = 0+4 = 4$ $0+3^2 = 0+9 = 9 \% 7 = 2$ ***(students are supposed to show the output by drawing the hash table)***	(10)
		****	

APJ ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY
KTU
2019