_____ C.U.SHAH UNIVERSITY **Summer Examination-2018**

Subject Name : Introduction to Algorithms & Data Structures

	Subject	t Code : 4	CS04IDS1	Branch	h: B.Sc.I.T.		
	Semest	er : 4	Date : 26/04/2018	Time :	10:30 To 01:30	Marks : 70	
	Instruct (1) (2) (3) (4)	ions: Use of P Instructio Draw nea Assume	rogrammable calculator ons written on main ans at diagrams and figures suitable data if needed.	& any other electr ver book are strict if necessary) at rig	onic instrument is ly to be obeyed. ght places.	prohibited.	
Q-1		Attempt	t the following question	s:			(14)
	a)	Two mai A. Proc C. Time	in measures for the effic ressor and memory e and space	ency of an algorit B. Comp D. Data a	hm are : lexity and capacity and space	ý	
	b)	Process A. Crea C. Push	of inserting an element	in stack is called _ B. Evalu D. Pop	ation		
	c)	Which A. Que C. Arra	data structure is used fo ue y	implementing rec B. Stack D. List	eursion?		
	d)	The dat A. Stac C. Quer	a structure required for k ue	Breadth First Trav B. Array D. List	ersal on a graph is	?	
	e)	A Stack A. FIFC C. Arra	c follows D y	B. LIFO D. List			
	f)	What i A. A q B. A q C. A q D. Nor	s a dequeue? ueue with insert/delete of ueue implemented with ueue implemented with ne of above	efined for both fro a doubly linked lis both singly and do	ont and rear ends of t ubly linked lists	f the queue	
	g)	What is a A. A st B. A st C. A st D. A st	a hash table? ructure that maps values ructure that maps keys t ructure used for storage ructure used to impleme	to keys values nt stack and queue			
	h)	What is a A. A f B. A f	a hash function? Junction has allocated m Junction that computes t	emory to key le location of the k	tey in the array		



		C. A function that creates an array		
	i)	D. None of the mentioned	2	
	1)	A 2	B Any number of children	
		C. 0, 1 or 2	D. 0 or 1	
	j)	A terminal node in a binary tree is called		
		A. root	B. leaf	
	• >	C. Child	D. Branch	
	K)	$L = 2.5 J = \$	D 0.5	
		A. 2.5 C -2	B2.5 D3	
	l)	BST stands for	D 3	
		A. Binary Search Tree	B. Beta Search Tree	
	m`	C. Balanced Search Tree DFS stands for	D. None of the above	
		A Donth First Sout	D. Donth First Soorch	
		C. Defined Following Search	D. Defined First Search	
	n) 1	Which indicates pre-order traversal?A. Left sub-tree, Right sub-tree and rooB. Right sub-tree, Left sub-tree and rooC. Root, Left sub-tree, Right sub-tree	ot ot	
Attom	nt onv	D. Right sub-tree, root, Left sub-tree four questions from Ω_{-2} to Ω_{-8}		
Attem	pt any i	Tour questions from Q-2 to Q-8		
Q-2		Attempt all questions		(14)
	a)	Explain characteristics of algorithm.		(5)
	b)	Explain various control mechanisms with	h pseudo code example	(5)
	c)	Explain representation of sets with exam	ple.	(4)
Q-3		Attempt all questions		(14)
	a)	What is recursion ? Write an algorithm f	or finding factorial using recursion.	(5)
	b)	Using mathematical induction prove that $1+2+3++n=n(n+1)/2$ for every $n>=1$		(5)
	c)	What is DEQueue ? Explain its types.		(4)
Q-4		Attempt all questions		(14)
	a)	Explain binary search with its process.		(5)
	b)	What is spanning tree ? Explain with its	properties.	(5)
	c)	Explain types of linked lists with diagrar	n.	(4)
Q-5		Attempt all questions		(14)
	a)	Write an algorithm for PUSH, POP and	PEEK operation on Stack	(5)
	b)	What is hash table ? Explain hash function	on.	(5)
	c)	Write Properties of Red black tree.		(4)



Q-6		Attempt all questions	(14)	
C	a)	Explain types of functions with diagram	(7)	
	b)	Explain asymptotic notation.	(7)	
Q-7		Attempt all questions	(14)	
-	a)	Explain differences between DFS and BFS.	(7)	
	b)	Explain graph representation methods with examples	(7)	
Q-8		Attempt all questions	(14)	
C C	a)	Find MST using Krushkal's algorithm	(7)	
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(7)

