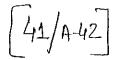
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SARDAR PATEL UNIVERSITY

Master of Computer Applications (MCA)

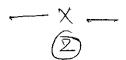
Semester - III External Examinations

PS03CMCA23 - Analysis and Design of Algorithms

11th April, 2019, Thursday

Hm	e: 02:00	p.m. to 05:00 p.m.		Max Marks: 70	
Q1.	Choos	e the most appropriate opti	h question.	[8]	
i.	As per pseudo code convention of algorithms, comment begins with				
	(A)	/	(C)	//	
	(B)	*	(D)	None of these	
ii.	Which	of the following can be used	l with Finc	operations efficiently?	
	(A)	Merge Rule	(C)	Collapsing Rule -	,
	(B)	Search Rule		None of these	
iii.	The data structure that supports the operation of search min (or max), insert and delete min				
		ix) is called a			
	(A)	Priority Queue	(C)	Both (A) & (B)	
	(B)	Heap	(D)	None of these	
iv.	Optimal Storage on Tapes problem fits into				
	(A)	Subset Paradigm	(C)	Ordering Paradigm	
	(B)	Sorting Paradigm		All of these	
٧.	Books and the problem metalion independent are canca				
	(A)	Dynamic trees	(C)	Both (A) & (B)	
	(B)	Static trees	(D)	None of these	
vi.		is a generated node v	ot to be expanded further.		
	(A)	Live node	(C)	Dead node	
	(B)	E-node	(D)	None of these	
vii.	are those problem states s for which the path from the root to s defines tuple in				J
	the sol	ution space.			
	(A)	Solution states	(C)	Both (A) & (B)	
	(B)	Answer states	(D)	None of these	
viii.	are rules that do not restrict each x_i to take on values only from a given set.				
	(A)	Implicit constraints	(C)	Both (A) & (B)	
	(B)	Explicit constraints	(D)	None of these	
Q2.	Answe	r the following questions (A	:	[14]	
a.	Compa	re Heapify and Insert.	•		
b.	What is	s time complexity?			
c.	Prove:	$3n + 2 = \Theta(n)$,	
d.	What is	s main idea of greedy metho	ds?		
e.		s Knapsack problem?	•	200	۸)
		Promote be an interest		CP:T:	(U)
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- f. Explain principal of optimality with an example. Define: Sum of subset. Give an example g. What is Optimal binary Search Tree? h. i. Explain Hamiltonian cycle. Answer the following questions: Q3. [6] Explain the term algorithm. write a note on recursive algorithms. a. Explain the concept of trees. Explain the method of representing binary tree as an array. [6] b. OR [6] Write Heapify algorithm. b. Q4. Answer the following questions: [6] Explain the measures on the basis of which one can decide which object to be selected next in a. knapsack problem. [6] Discuss the Prim's method for finding the minimum cost spanning tree. Also show proper b. example. Explain single source shortest path problem by giving suitable example. [6] b. Q5. Answer the following questions: [6] Write algorithm of graph coloring problem. Explain it taking suitable example. a. [6] Write algorithm of n-queens problem. Explain it taking suitable example. b. Write an algorithm of multistage graph problem (Forward approach). Explain it taking suitable [6] b. example. Answer the following questions: Q6. [6] Explain Least Cost search in detail taking suitable examples. a. [6] Explain the 15-puzzle problem taking example of BFS approach. b. OR Consider the travelling salesperson instance defined by the following cost matrix: [6] b.
 - (i) Obtain the reduced cost matrix.
 - (ii) Generate its state space tree using Least Cost Branch-and-Bound.



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