PVP 20

Code: 20CS3402

II B.Tech - II Semester – Regular / Supplementary Examinations
MAY - 2024

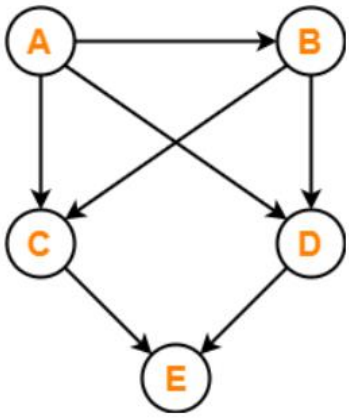
ADVANCED DATA STRUCTURES
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.
2. All parts of Question must be answered in one place.
BL – Blooms Level CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1	a)	Compare and contrast separate chaining with other collision resolution techniques such as linear probing, quadratic probing, and double hashing.	L2	CO1	7 M
	b)	The keys 232, 138, 123, 312, 3, 23, 17 and 215 are inserted into an initially empty hash table of length 11 using open addressing with hash function h(k) = k mod 11 and Quadratic probing. What is the resultant hash table?	L3	CO2	7 M
OR					

2	a)	What role do hash tables play in the standard library of programming languages?	L2	CO1	7 M
	b)	The keys 22, 38, 13, 12, 3, 23, 7 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?	L3	CO2	7 M
		UNIT-II			
3	a)	Define Priority Queue and explain its significance in computer science.	L2	CO1	7 M
	b)	Using an example, explain how the merge operation works in binomial queues.	L3	CO3	7 M
		OR			
4	a)	Interpret the basic operations on a Binary Heap: insert and delete with an example.	L3	CO3	7 M
	b)	What is a priority queue, and how is it different from a regular queue?	L2	CO1	7 M
		UNIT-III			
5	a)	Write insertion and searching operations on AVL trees.	L2	CO1	7 M
	b)	Can you illustrate the structure of a 2-3 tree and explain its properties?	L3	CO3	7 M
		OR			
6	a)	Explain the procedure for deleting an element from a 2-3 tree.	L2	CO1	7 M

	b)	Construct red-black tree that results when you insert the keys 2 1 4 5 9 3 6 7 in that order into an initially empty tree.	L3	CO3	7 M
		UNIT-IV			
7	a)	Explain Dijkstra's algorithm with an example.	L2	CO1	7 M
	b)	Describe an algorithm for performing topological sort on a directed graph.	L2	CO3	7 M
		OR			
8	a)	Explain the Bellman-Ford algorithm for finding the shortest paths from a single source vertex to all other vertices in a weighted graph with negative edge weights.	L2	CO1	7 M
	b)	Using the following directed acyclic graph  Find the topological sorting for the given graph.	L3	CO3	7 M
		UNIT-V			
9	a)	Describe the Find operation and its significance in disjoint set operations.	L2	CO4	7 M

	b)	Analyse Rabin-Karp algorithm for the pattern ABABCABAB in the given string : ABABDABACDABABCABAB.	L4	CO4	7 M
OR					
10	a)	Relate how does the smart Union operation incorporate path compression?	L4	CO4	7 M
	b)	Explain the steps involved in the naive string-matching algorithm.	L2	CO1	7 M