Course Code: 20CS5001 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY :: PUTTUR

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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Advanced Data Structures (20CS5001) **Course & Branch**: M.Tech - CSE

Year & Sem: I-M.Tech & I-Sem **Regulation:** R20

UNIT-I
INTRODUCTION TO DICTIONARIES AND HASHING

1	a)	Define Dictionaries	[L1][CO1]	**[2M]**
	b)	How to implement dictionaries?	[L2][CO1]	**[10M]**
2	a)	Describe the process to implement Abstract Data Type	[L3][CO1]	**[6M]**
	b)	Explain review of hashing?	[L2][CO1]	**[6M]**
3		Define Hashing? Explain Hash Functions with suitable example?	[L3][CO1]	**[12M]**
4		Explain Collision Resolution Techniques in Hashing?	[L4][CO1]	**[12M]**
5	a)	What are all the operations on linear probing	[L2][CO1]	**[6M]**
	b)	Compare and explain the Challenges in Linear Probing	[L6][CO2]	**[6M]**
6	a)	With an example explain quadratic probing and use hashing.	[L5][CO1]	**[6M]**
	b)	Differentiate between linear probing and quadratic probing	[L4][CO1]	**[6M]**
7	a)	Explain the process of double hashing	[L3][CO1]	**[6M]**
	b)	Explain the advantages of double hashing with an example	[L4][CO1]	**[6M]**
8	a)	What is the default load factor for rehashing	[L2][CO1]	**[3M]**
	b)	Implement rehashing with an example	[L5][CO1]	**[9M]**
9	a)	Describe the structure of extendible hashing	[L3][CO1]	**[6M]**
	b)	With step by step implement the extendible hashing	[L6][CO1]	**[6M]**
10	a)	Compare rehashing and double hashing	[L4][CO1]	**[6M]**
	b)	Compare quadratic probing and rehashing	[L4][CO1]	**[6M]**

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UNIT-II
SKIP LISTS

1	a)	Write the Need for Randomizing	[L4][CO2]	**[4M]**
	b)	List out the different data structures and algorithms of randomizing	[L2][CO2]	**[8M]**
2	a)	Define skip list and explain skip list structure	[L3][CO2]	**[4M]**
	b)	Write the working procedure for skip list	[L4][CO2]	**[8M]**
3		With an example Explain basic operations on skip list	[L5][CO2]	**[12M]**
4	a)	Explain the structure of probabilistic skip list	[L3][CO2]	**[6M]**
	b)	What is the search cost of probabilistic skip list	[L2][CO2]	**[6M]**
5	a)	Give the properties of deterministic skip list	[L4][CO2]	**[6M]**
	b)	Differentiate between probabilistic and deterministic skip list	[L5][CO2]	**[6M]**
6	a)	What is binary search tree and explain advantages of binary search tree.	[L3][CO2]	**[4M]**
	b)	Create a binary search tree with the following data elements 45, 15, 79, 90, 10, 55, 12, 20, 50	[L5][CO2]	**[8M]**
7	a)	What is the balance factor of AVL Tree	[L1][CO2]	**[2M]**
	b)	With an example explain operations of AVL tree	[L6][CO2]	**[10M]**
8	a)	Is every AVL tree can be a Red-Black tree?justify.	[L6][CO2]	**[4M]**
	b)	Construct red black tree with sample data elements	[L6][CO2]	**[8M]**
9		What are 2-3 trees how it works with data structures discuss with an example?	[L4][CO2]	**[12M]**
10	a)	Explain Splay- trees with neat diagram?	[L3][CO2]	**[6M]**
	b)	Explain the operations on B-Tree	[L3][CO2]	**[6M]**

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UNIT-III
TEXT PROCESSING

1		Explain different string operations in c++	[L3][CO3]	**[12M]**
2		Implement the text processing software by applying brute force pattern matching	[L6][CO3]	**[12M]**
3		With an example solve the moore algorithm problem	[L4][CO3]	**[12M]**
4	a)	Explain components of The Knuth-Morris-Pratt (KMP)Algorithm	[L3][CO3]	**[6M]**
	b)	Calculate with example Running time analysis of KMP algorithm	[L6][CO3]	**[6M]**
5	a)	Explain text processing advantage and disadvantage of Standard Tries	[L3][CO3]	**[6M]**
	b)	How compressed Tries can be implemented to overcome the drawbacks of standard Tries	[L5][CO3]	**[6M]**
6		Compare standard Tries , Compressed Tries and suffix Tries	[L6][CO4]	**[12M]**
7		Construct The Huffman Coding Algorithm with an example	[L5][CO4]	**[12M]**
8	a)	Explain the two methods of Longest Common Subsequence Problem	[L2][CO4]	**[8M]**
	b)	Find the time complexity of LCS	[L3][CO4]	**[4M]**
9		Explain overlapping sub problems of LCS with a C Program	[L2][CO4]	**[12M]**
10		How to overcome the drawbacks of normal text processing approaches by Applying Dynamic Programming to the LCS Problem.	[L6][CO4]	**[12M]**

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UNIT-IV
COMPUTATIONAL GEOMETRY

1	a)	Define range searching and find the general time complexity	[L1][CO5]	**[4M]**
	b)	Explain one dimensional range searching in static and dynamic way	[L4][CO5]	**[8M]**
2		Construct a problem for clustered model with 2-dimensional range searching	[L5][CO5]	**[12M]**
3		Explain how to Search a Priority Search Tree works and its operations?	[L2][CO5]	**[12M]**
4		What is Priority Range Trees discuss with an example?	[L3][CO5]	**[12M]**
5		Construct the priority search tree and find the space complexity	[L6][CO5]	**[12M]**
6		Create a priority search tree and search an element by querying process	[L5][CO5]	**[12M]**
7		Describe Quad trees and its functions?	[L2][CO5]	**[12M]**
8		What is quad tree and explain insert and search operation on quad tree	[L3][CO5]	**[12M]**
9		Write a C++ program to demonstrates storage of nodes in a quad tree.	[L6][CO5]	**[12M]**
10	a)	Define K-D search tree and explain its operations	[L3][CO5]	**[6M]**
	b)	Write a C++ program to demonstrate insert and search operations	[L6][CO5]	**[6M]**

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UNIT-V
RECENT TRENDS IN HASHING

1		What is hashing? Explain about message digest and password verificaion	[L3][CO6]	**[12M]**
2		Describe various cryptographic hashing functions	[L3][CO6]	**[12M]**
3		In the real world where we will use hash functions. Justify.	[L6][CO6]	**[12M]**
4		Explain in brief applications of hashing	[L3][CO6]	**[12M]**
5		What are the advantage and disadvantage of Hashing	[L1][CO6]	**[12M]**
6		Explain some real facts about hashing	[L4][CO6]	**[12M]**
7		Explain Decision Trees for Geometric Models with some model	[L3][CO6]	**[12M]**
8		Implement binary tree as a workflow for compositing digital images for visual effects	[L6][CO6]	**[12M]**

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