

CMR TECHNICAL CAMPUS
UGC AUTONOMOUS
B. Tech. II Sem Supply End Examinations, January-2024
Data Structures
Common to ECE, AIML, CSM, CSC, CSE, IT & CSD

Time: 3 Hours

Max. Marks: 60

Note

- i. This Question paper contains Part- A and Part- B.
- ii. All the Questions in Part A are to be answered compulsorily.
- iii. All Questions from Part B are to be answered with internal choice among them.

PART-A

10 X 01 = 10 Marks

	Marks	CO	BL
1. a Define Data Structure. Write the characteristics of Data Structures.	1M	CO1	L1
b What are the disadvantages of arrays?	1M	CO1	L1
c Define Dictionary?	1M	CO2	L1
d What is Hash Function? List few Hash Function.	1M	CO2	L1
e Define AVL tree?	1M	CO3	L1
f Define Red-Black Tree?	1M	CO3	L1
g When is an undirected graph said to be 'connected'?	1M	CO4	L1
h List the application of graph?	1M	CO4	L1
i What is pattern Matching?	1M	CO5	L1
j Define Tries?	1M	CO5	L1

PART-B

5 X 10 = 50 Marks

	Marks	CO	BL
2. a Write a program to implement stack using arrays?	5M	CO1	L1
b Explain stack operations with suitable examples?	5M	CO1	L2
OR			
3. a Explain in detail about Single linked list and its algorithms for traversing, searching, insertion and deletion.	5M	CO1	L2
b Demonstrate stack ADT and implement Stack ADT using C program	5M	CO1	L2

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|----|---|--|-----|-----|----|
| 4 | a | Distinguish double hashing, rehashing and extendible hashing. | 5M | CO2 | L3 |
| | b | Explain Skip List with its operation. | 5M | CO2 | L2 |
| | | OR | | | |
| 5 | | Explain Collision resolution techniques in hashing. | 10M | CO2 | L2 |
| 6 | a | Elaborate Splay-trees with neat diagram? | 4M | CO3 | L2 |
| | b | Write a program to implement AVL tree operations and explain with suitable examples? | 6M | CO3 | L1 |
| | | OR | | | |
| 7 | a | Explain in detail about red black tree in data structure? | 4M | CO3 | L2 |
| | b | Write the AVL tree Deletion algorithm? | 6M | CO3 | L1 |
| 8 | | Write a program for merge sort. Sort the elements 21,61,29,52,39,43,33 using merge sort? | 10M | CO4 | L1 |
| | | OR | | | |
| 9 | a | Show how Heap sort algorithm works on the input: 5,9,1,7,3,8,6,2,4 | 5M | CO4 | L2 |
| | b | Write an algorithm for Depth First Search Traversal of a graph? | 5M | CO4 | L2 |
| 10 | a | What is a trie? Briefly describe compressed tries with its disadvantages. | 5M | CO5 | L1 |
| | b | Explain Knuth-Morris-Pratt Algorithm for string pattern-matching. | 5M | CO5 | L2 |
| | | OR | | | |
| 11 | a | Summarize the working of Brute force pattern matching? | 5M | CO5 | L2 |
| | b | Illustrate the operations of Boyer-Moore pattern matching algorithm with example. | 5M | CO5 | L2 |

CO : Course Outcomes

BL : Bloom's Taxonomy Levels

L 1 : Remembering

L 2 : Understanding

L 3 : Applying

L 4 : Analysing

L 5 : Evaluating

L 6 : Creating
