Code No: 153AK

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, December - 2019

DATA STRUCTURES

(Common to CSE, IT)

Time: 3 Hours **Max. Marks: 75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Explain how does linked stack differ from a linear stack. [2]
b) Define Searching. [2]
c) How many binary trees are possible with four nodes? [2]
d) Define tree traversal. [2]
e) What is pattern? [2]
f) Write the pseudo code for reversing the List using Stacks. [3]
g) Discuss about linear probing. [3]
h) Write about splay trees. [3]
i) What is Graph? Define degree of vertex. [3]
j) Write a short notes on standard tries. [3]

PART – B

(50 Marks)

2. What is priority Queue? Explain the implementation of Priority queue? Write an algorithm for operations on Priority queues. [10]

OR

3.a) Discuss about the stack with examples.
b) Write an algorithm to implement queue using stack. [5+5]

4. What is collision? Explain different collision resolution techniques with examples. [10]

OR

5. Describe the operations of skip list with an example. [10]

6. Write an algorithm for creation of binary tree using in-order traversal and post order traversals. [10]

OR

7. Construct the AVL tree of the following data. [10]
38, 40, 50, 2, 5, 76, 25, 14, 7

8. How to represent graphs? Explain. [10]

OR

9. Explain Heap sort algorithm. Create Heap for the following elements and then sort them.
(13, 102, 405, 136, 15, 105, 390, 432, 28, 444). [10]

10.a) Explain about Boyer-Moore algorithm in detail.
b) Discuss about Suffix tries. [5+5]

OR

11. Write Knuth-Morris-Pratt pattern matching algorithm. [10]

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Code No: RT22053 | R13 | SET - 1

II B. Tech II Semester Supplementary Examinations, April/May - 2019
ADVANCED DATA STRUCTURES
(Com. to CSE, IT)

Time: 3 hours | Max. Marks: 70

Note: 1. Question Paper consists of two parts (Part-A and Part-B)
2. Answer ALL the question in Part-A
3. Answer any THREE Questions from Part-B

PART-A

1. a) What is the worst case time complexity of searching an element in case of chaining method? Give an example of worst case time complexity?
b) Why LR and RL are called complex rotations explain with an example?
c) Create a min-heap and max-heap for the following list
(20; 10; 5; 4; 25; 70; 60; 40)
d) Discuss about time complexity of all pairs shortest method?
e) Discuss about time complexity of merge sort?
f) What are the applications of pattern matching algorithm? (4M+4M+4M+4M+3M+3M)

PART-B

2. Following elements are inserted into an empty hash table with hash function f(x) = x% 17 and quadratic probing. Explain.
58, 48, 79, 46, 54, 32, 24, 19, 18, 35, 15, 84, 16, 12 (16M)

3. a) Draw the hash table for each insertion.
b) What is the load factor after last insertion?
c) What is the maximum number of buckets examined in an unsuccessful search?
(8M+4M+4M)

4. a) Show the result of inserting 3 , 1 , 4 , 6 , 9 , 2 , 5 , 7 into an initially empty AVL tree?
b) Show the result after each insertion? Also show the result after deletion of the root?
(8M+8M)

5. a) Explain about Binomial Amortized Analysis?
b) Explain about binomial queue? (8M+8M)

6. a) Write and explain Floyd's algorithm?
b) Sort the following elements using quick sort
20,10,5,30,40,57, 35, 25,18,22,21 (8M+8M

7. a) List the advantages and disadvantages of Tries. (8M+8M
b) Discuss about fixed field buffers?

Code No: RT22053

R13

SET - 1

II B. Tech II Semester Supplementary Examinations, November– 2019
ADVANCED DATA STRUCTURES
(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (Part-A and Part-B)
2. Answer ALL the question in Part-A
3. Answer any THREE Questions from Part-B

PART –A

1. a) What are the methods used to represent Dictionary? (3M)
   b) Explain the properties of 2-3 trees. (3M)
   c) Create a min-heap and max-heap for the following list (5; 8; 3; 9; 2; 10; 1; 40) (4M)
   d) Write the Differences between spanning tree and minimum spanning tree. (4M)
   e) Discuss about time complexity of heap sort? (4M)
   f) Give some applications of Digital search trees. (4M)

PART -B

2. a) With an example, explain how insertion and deletion operations performed in skip list. (8M)
   b) Explain modulo division and digit extraction hashing methods with an example. (8M)

3. a) Explain about deletion procedure in AVL tree with an example. (8M)
   b) Create a 2-3 tree from the following list of data items: 5,6,8,21,12,30,34,27,23,4,33,7,24,9,10,11,13,38. (8M)

4. a) Illustrate the algorithm for deletion of an element from heap with an example. (8M)
   b) What is a priority queue? List and explain different ways of representing them. (8M)

5. a) How to find shortest path between two vertices using Dijkstra's algorithm? (8M)
   b) Explain with an example, Krushkal's algorithm for constructing a minimum cost spanning tree. (8M)

6. a) Give best case, Average case analysis of quick sort. (8M)
   b) Explain Radix sort using following elements. 45, 37, 05, 09, 06, 11, 18, 27. (8M)

7. a) Which pattern matching algorithm scans the characters from right to left? Explain it with suitable example. (8M)
   b) State different file organizations and discuss their advantages and disadvantages. (8M)

Code No: RT22053

R13

SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2018
ADVANCED DATA STRUCTURES
(Com. to CSE, IT)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

PART –A

1. a) Define ADT of dictionary? (3M)
   b) Which binary tree we call it as "almost complete binary tree"? Explain? (4M)
   c) What is Binary heap? (4M)
   d) Compare double hashing techniques with linear and quadratic probing? (4M)
   e) Explain, how tries differ from hash tables? (3M)
   f) Discuss various operation on files (4M)

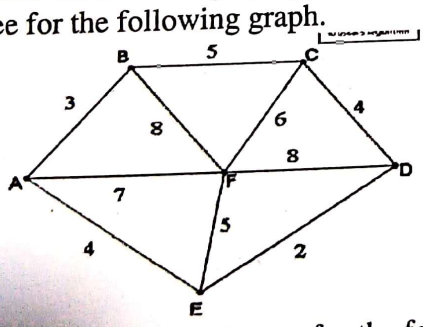
PART -B

2. a) Why rehashing is needed? What are the types of rehashing techniques available? Explain any one technique with examples? (7M)
   b) Explain how data is inserted and deleted from dictionaries while it is implemented using list data structure ? (7M)

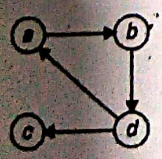
3. a) Explain three possible cases for inserting a node in the 2-3 Trees? Construct 2-3 Tree with the following data 50, 20,60,90, 40,100,10 (7M)
   b) Write Algorithm for 2-3 Tree deletion and discuss its analysis. (7M)

4. a) (i)Define Binomial queue, Binomial tree and Binomial heap? (7M)
   (ii)Explain the properties of Binomial trees?
   b) Show step by step process for constructing binary heap using the following data 10, 12, 1, 14, 6, 5, 8, 15, 3, 9, 7, 4, 11, 13 and 2. (7M)

5. a) Solve the following by apply kruskal's algorithm to find minimum cost spanning tree for the following graph. (7M)



b) Find the transitive closure for the following diagram using Warshall's algorithm? (7M)



Code No: RT22053

R13

SET - 1

6. a) Perform Quick sort with the following elements: 400,200, 100, 750, 500, 150,300, 600 (7M)

   b) Give the algorithm for Radix sort and explain the process with an example? (7M)

7. a) Illustrate Boyers Moore algorithm with the following text and pattern? (7M)

   Text : A A B A A C A A D A A B A A B A

   Pattern : A A B A

   b) Discuss the following: (7M)

   (i) Digital search trees

   (ii) Binary tries

Code No: 153AK

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2021
DATA STRUCTURES
(Common to CSE, IT, ITE)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1.a) Discuss in brief about single linked list.
b) Write a C program to convert infix to postfix expression. [7+8]

2. What are different methods of collision resolution in hashing? Explain in brief. [15]

3.a) Discuss in detail about red-black trees.
b) Explain briefly about binary search trees. [7+8]

4. How a graph is traversed using depth first search? Explain with example. [15]

5. Explain the process of heap sort with example. [15]

6. Explain in brief about tries with example. [15]

7. Compare and contrast different sorting methods. [15]

8. Explain in detail about skip lists in data structures. [15]

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R18

Code No: 153AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, September - 2021
DATA STRUCTURES
(Common to CSE, IT, ITE)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1.a) Write an algorithm of Push and Pop operations on a stack.
b) Differentiate between stack and queue. [8+7]

2. Insert the following list of elements into the hash table by using Quadratic probing (size of Hash table is 13) 65, 34, 79, 114, 26, 85, 55, 89, 22, 98. [15]

3. Insert the following list of elements from the Red- Black tree. Delete the elements 18, 2 and 30 from the Red-Black tree 12, 30, 36, 18, 25, 9, 4, 2, 17, 14, 20, 47. [15]

4. Sort the following list of elements by using Merge sort
30, 56, 78, 99, 12, 43, 10, 24, 85 [15]

5.a) Write an algorithm of Standard Tree
b) Explain the features that distinguish between Boyer Moore algorithm from the conventional algorithms. [7+8]

6.a) Write an algorithm for insertion of node at last position in Linear Linked List.
b) Evaluate the following postfix expression using stack. Show each step
5 3 + 6 2 / * 3 5 * +. [7+8]

7. Write an algorithm of skip list operations insertion and deletion. [15]

8. Explain the operations of Splay tree with an example. [15]

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