



Your roots to success.

NARSIMHA REDDY ENGINEERING COLLEGE UGC-AUTONOMOUS INSTITUTION

An Autonomous Institute
NAAC Accreditation 'A' Grade
Accredited by NBA
Approved by AICTE, Affiliated to JNTUH

School of Computer Science

Previous Year Question Papers

Code No: 153AK

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year I Semester Examinations, April/May - 2023

DATA STRUCTURES

(Common to CSE, IT, ECM, CSBS, CSIT, ITE, CE(SE), CSE(CS), CSE(DS), CSE(IOT),
CSE(N), AI&DS, AI&ML, CSD)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

- 1.a) Give examples for stack. [2]
- b) How to construct a queue using stacks? [3]
- c) What is a skip list? [2]
- d) List the drawbacks of open addressing. [3]
- e) What does the color notate in red-black tree? [2]
- f) What operations are performed on Splay trees? [3]
- g) What is a max heap? [2]
- h) Give example for adjacency list of a graph. [3]
- i) Define trie. [2]
- j) What are the merits and demerits of brute force method for pattern matching? [3]

PART – B

(50 Marks)

2. Write and explain algorithms for Push and pop operations of stack using linked list. [10]
- OR**
- 3.a) Describe the conditions of overflow and underflow in a queue.
- b) Discuss the applications of queues. [5+5]
- 4.a) Demonstrate skip list representation of a dictionary.
- b) How to perform reassign operation on a dictionary. [5+5]
- OR**
5. Explain the algorithm for implementing quadratic probing on a hash table. [10]
- 6.a) Illustrate search operation on binary search tree.
- b) Discuss the importance of height balanced trees for searching. [5+5]
- OR**
- 7.a) With suitable examples, illustrate right-left rotation on AVL tree.
- b) Differentiate between splay tree and red-black tree. [5+5]
8. Make a comparison of breadth first search and depth first search for a graph. [10]
- OR**
9. Write an algorithm for merge sort and explain with a suitable example. [10]
10. Describe the Knuth-Morris-Pratt algorithm for pattern matching. [10]
- OR**
11. "A compressed trie is an advanced version of the standard trie." Support or oppose this statement with necessary explanation. [10]

Q.P Code: CS2102PC

Hall Ticket No.:

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NARSIMHA REDDY ENGINEERING COLLEGE
(UGC AUTONOMOUS)

II B.Tech I Semester (NR21) Supplementary Examination, July 2023
DATA STRUCTURES
(Computer Science and Engineering)

Time : 3 hours

Maximum marks: 70

- Note:**
- This question paper contains two parts, A and B
 - Part A is compulsory which carries 20 marks (10 sub questions are two from each unit carry 2 Marks). Answer all questions in Part A
 - Part B Consists of 5 Units. Answer one question from each unit. Each question carries 10 Marks and may have a, b sub questions

Part-A (20 Marks)
Answer all questions

Q.No	Question	M	CO	BL
1) a	What are applications of stacks?	2	CO1	L1
b	List out the areas in which data structures are applied extensively.	2	CO2	L2
c	Illustrate the differences between linear list representations and skip list representation.	2	CO1	L1
d	Define Hash function	2	CO1	L1
e	How to resolve null links in a binary search tree?	2	CO3	L2
f	What is Red-Black tree? Give an example	2	CO1	L2
g	Give the best case, average case, worst case time complexity of recursive merge sort.	2	CO2	L2
h	Define graph and give an example?	2	CO1	L2
i	What is the need of external sorting?	2	CO2	L2
j	What are the advantages of Tries?	2	CO2	L1

Part-B (50 Marks)
Answer all the Units
All Questions carry equal Marks

Q.No	Question	M	CO	BL
UNIT-I				
2) a	Examine the applications of stack.	5	CO1	L3
b	Explain array based implementation of stacks	5	CO1	L2
OR				
3) a	Illustrate the difference between a queues and linked lists with an example	5	CO2	L3
b	Give an algorithm for push and pop operations on stack using a linked list.	5	CO2	L2
UNIT-II				
4) a	Consider a hash table with 100 slots. Collisions are resolved using chaining. Assuming simple uniform hashing, what is the probability that the first 3 slots are unfilled after the first 3 insertions?	5	CO3	L3

Page 1 of 2

b	Explain various linked list representation operations in detail.	5	CO2	L2																				
OR																								
5) a	What is collision? and what are collision resolution techniques?	5	CO3	L3																				
b	A hash table of length 10 uses open addressing with hash function $h(k)=k \text{ mod } 10$, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.	5	CO3	L4																				
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6) a	How the Insertion and Deletion operations performed in Binary search trees.	5	CO2	L3																				
b	Write short notes on Splay Trees.	5	CO2	L2																				
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7) a	Define AVL tree and Explain different rotations in AVL tree	5	CO3	L3																				
b	Build an AVL tree with the following values: 20,11,5,32,40,2,4,27,23,28,50.	5	CO4	L4																				
UNIT-IV																								
8) a	Compare and contrast different sorting methods?	5	CO1	L2																				
b	Explain how to insert and delete an element into Max heap?	5	CO2	L3																				
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9) a	Write external sorting algorithm and explain with an algorithm.	5	CO2	L3																				
b	Explain Depth First Search and Breadth First Search algorithms in detail.	5	CO1	L3																				
UNIT-V																								
10) a	Distinguish between Standard Tries and Compressed Tries	5	CO4	L2																				
b	Write an Algorithm for KMP pattern technique	5	CO4	L2																				
OR																								
11) a	What brute force algorithm. Explain string pattern matching average analysis.	5	CO4	L3																				
b	You are given a string "s" and s pattern "p", you need to check if the pattern is there in the string by using Brute force algorithm. S = "prodeveloptutorial" P = "ria!"	5	CO4	L4																				

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Q.P Code: CS2102PC

Hall Ticket No.:

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NARSIMHA REDDY ENGINEERING COLLEGE
(UGC AUTONOMOUS)

II B.Tech I Semester (NR20) Supplementary Examination, July 2023

DATA STRUCTURES
(Computer Science and Engineering)

Time : 3 hours

Maximum marks: 75

- Note: • This question paper contains two parts, A and B
 • Part A is compulsory which carries 25 marks (1st 5 sub questions are one from each unit carry 2 Marks each & Next 5 sub questions are one from each unit carry 3 Marks). Answer all questions in Part A
 • Part B Consists of 5 Units. Answer one question from each unit. Each question carries 10 Marks and may have a, b sub questions

Part-A (25 Marks)
Answer all questions

Q.No	Question	M	CO	BL
1)	a. What are applications of stacks?	2	CO1	L1
	b. List out the areas in which data structures are applied extensively.	2	CO2	L2
	c. Illustrate the differences between linear list representations and skip list representation.	2	CO3	L1
	d. Define Hash function.	2	CO4	L1
	e. How to resolve null links in a binary search tree?	2	CO5	L2
	f. What is Red-Black tree? Give an example	3	CO1	L2
	g. Give the best case, average case, worst case time complexity of recursive merge sort.	3	CO2	L2
	h. Define graph and give an example?	3	CO3	L2
	i. What is the need of external sorting?	3	CO4	L2
	j. What are the advantages of Tries?	3	CO5	L1

Part-B (50 Marks)
Answer all the Units
All Questions carry equal Marks

Q.No	Question	M	CO	BL
UNIT-I				
2)	a. Examine the applications of stack.	5	CO1	L3
	b. Explain array based implementation of stacks	5	CO1	L2
OR				
3)	a. Illustrate the difference between a queues and linked lists with an example	5	CO2	L3
	b. Give an algorithm for push and pop operations on stack using a linked list.	5	CO2	L2
UNIT-II				
4)	a. Consider a hash table with 100 slots. Collisions are resolved using chaining. Assuming simple uniform hashing, what is the probability that the first 3 slots are unfilled after the first 3 insertions?	5	CO3	L3

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	b. Explain various linked list representation operations in detail.	5	CO2	L2																				
OR																								
5)	a. What is collision? and what are collision resolution techniques?	5	CO3	L3																				
	b. A hash table of length 10 uses open addressing with hash function $h(k)=k \text{ mod } 10$, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.	5	CO3	L4																				
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	b. Explain how to insert and delete an element into Max heap?	5	CO2	L3																				
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9)	a. Write external sorting algorithm and explain with an algorithm.	5	CO2	L3																				
	b. Explain Depth First Search and Breadth First Search algorithms in detail.	5	CO1	L3																				
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	b. Write an Algorithm for KMP pattern technique	5	CO4	L2																				
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	b. You are given a string "s" and a pattern "p", you need to check if the pattern is there in the stringly using Brute force algorithm. S = "prodeveloptutorial" P = "trial"	5	CO4	L4																				

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Q.P Code: DS2102PC

Hall Ticket No.:

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II B.Tech I Semester (NR21) Supplementary Examination, July 2023

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(Computer Science and Engineering (Data Science))

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Part-A (20 Marks)
Answer all questions

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b.	List out the areas in which data structures are applied extensively.	2	CO2	L2
c.	Illustrate the differences between linear list representations and skip list representation.	2	CO1	L1
d.	Define Hash function.	2	CO1	L1
e.	How to resolve null links in a binary search tree?	2	CO3	L2
f.	What is Red-Black tree? Give an example	2	CO1	L2
g.	Give the best case, average case, worst case time complexity of recursive merge sort.	2	CO2	L2
h.	Define graph and give an example?	2	CO1	L2
i.	What is the need of external sorting?	2	CO2	L2
j.	What are the advantages of Tries?	2	CO2	L1

Part-B (50 Marks)
Answer all the Units
All Questions carry equal Marks

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