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]

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Q.P Code: CS2102PC Hall Ticket No.:

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
	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 mod 10, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below. 0 : 1 : 2 : 42 3 : 23 4 : 34 5 : 52 6 : 46 7 : 33 8 : 9 : Find the possible order values in which the key values could have been inserted in the table?	5	CO3	L4
		UNIT–III			
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
		OR			
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
		OR			
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 stringby using Brute force algorithm. S = "prodevelopertutorial" P = "rial"	5	CO4	L4

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Q.P Code: CS2102PC Hall Ticket No.:

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 (1^{st} 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
	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 mod 10, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.	5	CO3	L4

0	
1	
2	42
3	23
4	34
5	52
6	46
7	33
8	
9	

Find the possible order values in which the key values could have been inserted in the table?

		UNIT–III			
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
		OR			
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
		OR			
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 stringby using Brute force algorithm. S = "prodevelopertutorial" P = "rial"	5	CO4	L4

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Q.P Code: DS2102PC Hall Ticket No.:

NARSIMHA REDDY ENGINEERING COLLEGE
(UGC AUTONOMOUS)

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

DATA STRUCTURES

(Computer Science and Engineering (Data Science))

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

	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 mod 10, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below. 0 1 2 42 3 23 4 34 5 52 6 46 7 33 8 9 Find the possible order values in which the key values could have been inserted in the table?	5	CO3	L4
		UNIT–III			
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
		OR			
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
		OR			
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 stringby using Brute force algorithm. S = "prodevelopertutorial" P = "rial"	5	CO4	L4

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