## **Previous Year Question Papers**

R18 Code No: 153AK 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) Max. Marks: 75 Time: 3 Hours 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] How to construct a queue using stacks? [3] What is a skip list? [2] List the drawbacks of open addressing. [3] d) [2] What does the color notate in red-black tree? [3] [2] What operations are performed on Splay trees? What is a max heap? Give example for adjacency list of a graph. [3] Define trie [2] i) What are the merits and demerits of brute force method for pattern matching? i) 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. Discuss the applications of queues. [5+5] 4.a) Demonstrate skip list representation of a dictionary. [5+5] How to perform reassign operation on a dictionary. 5. Explain the algorithm for implementing quadratic probing on a hash table. [10]Illustrate search operation on binary search tree. 6.a)Discuss the importance of height balanced trees for searching. [5+5] 7.a) With suitable examples, illustrate right-left rotation on AVL tree. Differentiate between splay tree and red-black tree. [5+5] Make a comparison of breadth first search and depth first search for a graph. [10]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 "A compressed trie is an advanced version of the standard trie." Support or oppose this statement with necessary explanation.

Q.I	P Co	der CS2102PC Hall Ticket No.:	Ц		
		NARSIMHA REDDY ENGINEERING COLLEGUC (UGC AUTONOMOUS)	GE		
		II B.Tech I Semester (NR21) Supplementary Examination, July	v 200	23	
		DATA STRUCTURES (Computer Science and Engineering)			
Tin	ne ri	hours Maximum	n m	irks: 7	0
No		This question paper contains two parts, A and B     Part A is compulsory which carries 20 marks (10 sub questions ar unit carry 2 Marks). Answer all questions in Part A     Part B Consists of 5 Units. Answer one question from each unicarries 10 Marks and may have a, b sub questions     Part-A     Answer all questions	t. Er		stion
0	No	Ouestion	M	co	BI.
1)	1.	What are applications of stacks?	2	COL	
'	b.	List out the areas in which data structures are applied extensively.	2	CO2	
	€.	Illustrate the differences between linear list representations and skip list representation.	2	COI	
	d	Define Hash function.	2	COI	LI
	e.	How to resolve null links in a binary search tree?	2	CO3	1.2
	f.	What is Rod-Black tree? Give an example	2	COI	1.2
	8	Give the best case, average case, worst case time complexity of recursive merge sort.	2	CO2	1.2
	h.	Define graph and give an example?	2	COL	1.2
	i.	What is the need of external sorting?	2	CO2	1.2
	1	What are the advantages of Tries?	2	CO2	LI
		Part-B Answer all the Units All Questions carry equal Marks	(5	0 Mar	ks)
Q	.No	Question M	C	0	BL.
		UNIT-I	-		
2)		Examine the applications of stack. 5	C		L3
	b.	Explain array based implementation of stacks 5	C	01	L2
-	-	OR	-	-	
3)	B,	Illustrate the difference between a queues and linked lists 5	C	02	IJ

a. Illustrate the difference between a queues and linked lists 5 CO2 L3 with an example
 b. Give an algorithm for push and pop operations on stack using 5 CO2 L2
 a linked list.

 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?

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	b.	Explain various linked list representation operations in detail.	5	CO2	1.2
		OR			
5)	ā.	What is collision? and what are collision resolution techniques?	5	CO3	1.3
	b.	A hash table of length 10 uses open addressing with hash function h(k)nk mod 10, and linear probing. After inserting 6 values into an empty hash table, the table is as shown below.    O	5	CO3	L4
_		have been inserted in the table?			
6	-	UNIT-III	-	T 2020A T	- 11
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	1.2
		OR			
7)	a.	Define AVL tree and Explain different rotations in AVL tree	5	CO3	1.3
	b.	Build an AVL tree with the following values: 20,11,5,32,40,2,4,27,23,28,50.	5	CO4	L
		UNIT-IV		Service I	
8)	a	Compare and contrast different sorting methods?	5	COI	1.2
	b.	Explain how to insert and delete an element into Max heap?	5	CO2	1.3
		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	1.3
		UNIT-V			
10)	4	Distinguish between Standard Tries and Compressed Tries	5	CO4	1.2
	h.	Write an Algorithm for KMP pattern technique	5	CO4	1.2
		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	LA

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Q.P Code: CS2102PC Hall Ticket No.:						1 b	T	b.	Explain various linked list representation operations in detail.	5	CO2	L2
		NARSIMHA REDDY ENGINEERING COLLI (UGC AUTONOMOUS)	EGI	E		5) a	5)	a.	What is collision? and what are collision resolution techniques?	5	CO3	L3
		II B.Tech I Semester (NR20) Supplementary Examination, Ju DATA STRUCTURES (Computer Science and Engineering)	ily 20	2023					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
Time: 3 hours Maximu					5_				2 42			
No	•	This question paper contains two parts, A and B Part A is compulsory which carries 25 marks (1 <sup>st</sup> 5 sub questions unit carry 2 Marks each & Next 5 sub questions are one from Marks). Answer all questions in Part A Part B Consists of 5 Units. Answer one question from each un carries 10 Marks and may have a, b sub questions	each	unit ca	arry 3				4 34 5 5 52 6 46 7 33 8 9 9 Find the possible order values in which the key values could have been inserted in the table?			
Part-A				(25 Marks)				_	UNIT-III			
Q.	No.	Answer all questions  Question	T.	1 CO	T nx	6) a	6)	a.	How the Insertion and Deletion operations performed in Binary search trees.	5	CO2	L3
1)	1.	What are applications of stacks?		COL		b	1	b.	Write short notes on Splay Trees.	5	CO2	L2
"	b.	List out the areas in which data structures are applied extensively.		CO2				_	OR			
	C,	Illustrate the differences between linear list representations and skip list representation.	d 2	CO3		7) a	تجلنات	b.	Define AVL tree and Explain different rotations in AVL tree Build an AVL tree with the following values: 20,11,5,32,40,2,4,27,23,28,50.	5	CO3	L3 L4
	d.	Define Hash function.		CO4		-	-	-	20,11,3,32,40,2,4,21,23,28,30. UNIT-IV	ш	_	_
	e.	e. How to resolve null links in a binary search tree?		CO5		8) a	83 1	. 1	Compare and contrast different sorting methods?	5	COI	10
	f.	What is Red-Black tree? Give an example		COL		MCMP WAR	riefwa jay	b.	Explain how to insert and delete an element into Max heap?	5	CO2	L3
		Give the best case, average case, worst case time complexity or	f 3	CO2	1.2	10.	- 10	0.	OR	3	COZ	Lo
		recursive merge sort.				9) a	0) [	. 1	Write external sorting algorithm and explain with an	5	CO2	L3
	h.	Define graph and give an example?	3			"	"	75.0	algorithm.	,	0.02	103
	į.	What is the need of external sorting? What are the advantages of Tries?	3	CO4		b	1	b.	Explain Depth First Search and Breadth First Search algorithms in detail.	5	COI	L3
			20	50 Mar			_	_	UNIT-V	-		
Part-B Answer all the Units					ks)	10) a	0) [	a.	Distinguish between Standard Tries and Compressed Tries	5	CO4	1.2
						b	1		Write an Algorithm for KMP pattern technique	5	CO4	1.2
		All Questions carry equal Marks						-	OR		minima	
Q.	Q.No Question M UNIT-I		1 (	00	BL	11) a.	1) 1		What brute force algorithm. Explain string pattern matching average analysis.	5	CO4	L3
2)	a.	Examine the applications of stack. 5		201	L3	b.	1		You are given a string "s" and s pattern "p", you need to	5	CO4	1.4
	b.	Explain array based implementation of stacks 5	(	201	1.2				check if the pattern is there in the stringby using Brute force			
		OR		No. 1					algorithm.			
3)	a.	Illustrate the difference between a queues and linked lists 5 with an example	C	02	L3				S ≈ "prodevelopertutorial" P = "rial"			

Hall Ticket No.:

Q.P Code: CS2102PC

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with an example
b. Give an algorithm for push and pop operations on stack using 5 CO2 a linked list.

UNIT-II

4) a. Consider a hash table with 100 slots. Collisions are resolved 5 CO3 using chaining. Assuming simple uniform hashing, what is the probability that the first 3 slots are unfilled after the first

3.P C	ode: DS2102PC Hall Ticket No.:						TE	Explain various linked list representation operations in detail. 5 CO2
				Ш		-	10.	Explain various linked list representation operations in detail.   5   CO2   OR
	NARSIMHA REDDY ENGINEERING COLI (UGC AUTONOMOUS)	E	SE			5)	a.	
							b.	
	II B.Tech I Semester (NR21) Supplementary Examination,	July	2023					function h(k)=k mod 10, and linear probing. After inserting 6
	DATA STRUCTURES							values into an empty hash table, the table is as shown below.
	(Computer Science and Engineering (Data Science	()						0
Time:	3 hours Maxis	nun	mari	ks: 70	0			2 42
Note:	This question paper contains two parts, A and B Part A is computeory which carries 20 marks (10 sub question unit carry 2 Marks). Answer all questions in Part A Part B Consists of 5 Units. Answer one question from each carries 10 Marks and may have a, b sub questions		Each	que	stion			### 34 54 55 55 55 55 55 55 55 55 55 55 55 55
	Part-A		(20 N	farks	s)		-	UNIT-III
	Answer all questions					61	l a.	How the Insertion and Deletion operations performed in 5 CO2
Q.No	Question	-		-	1	1	1	Binary search trees.
	What are applications of stacks?	-	M 2 0				b.	Write short notes on Splay Trees. 5 CO2
	List out the areas in which data structures are applied extensively		2			50.0		OR
e.	Illustrate the differences between linear list representations a	nd.	2 1			7)		Define AVL tree and Explain different rotations in AVL tree 5 CO3
1	skip list representation.	unu.		.01	1		b.	
d.	Define Hash function.	-	2 (	701	1.1		_	20,11,5,32,40,2,4,27,23,28,50.
e.			2 1			-	-	UNIT-IV
f.	What is Red-Black tree? Give an example		2 (			8)	1.0	Compare and contrast different sorting methods? 5 COI
8	Give the best case, average case, worst case time complexity	of	2 (				j b.	Explain how to insert and delete an element into Max heap? 5 CO2
	recursive merge sort.		2			93	Ta.	OR
h.	Define graph and give an example?		2 (			.9)	1.	Write external sorting algorithm and explain with an 5 CO2
1.	What is the need of external sorting?		2 1				b.	
1	What are the advantages of Tries?	-	2 1	:02	LI		1	algorithms in detail.
	Part-B		(50	Mari	les)	1	-	UNIT-V
	Answer all the Units		100	-	000	10)	1.	
	All Questions carry equal Marks						b.	Write an Algorithm for KMP pattern technique 5 CO4
O.No	Ouestion	M	co	T	BL	113	a.	
-	UNIT-I	78.		-	200.	111)	1"	average analysis.
2) a		5	COI	T	1.3		b.	
b		5	COL		1.2		1	check if the pattern is there in the stringby using Brute force
	OR	_						algorithm.
3) a	with an example		CO2		1.3			S = "prodevelopertutorial" P = "rial"
b	a linked fist.	5	CO2		L2			-00000-
	UNIT-II							
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	b.	Explain various linked list representation operations in detail.	5	CO2	1.2
25.7	_	OR	110		10%
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_	-	UNIT-III	_		
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	h.	Write short notes on Solay Trees.	-5	CO2	1.2
0.0		OR	-		-
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-		UNIT-IV		Lucia	1
8)	a.	Compare and contrast different sorting methods?	5	COL	1.2
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10)	a.	Distinguish between Standard Tries and Compressed Tries	5	CO4	1.2
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		OR		V222-4	5.0
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