R-19

Code: 19B512T

M.Tech. I Semester Regular Examinations February 2020

Advanced Data Structures

(Computer Science and Engineering)

Max. Marks: 60   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1.   Assuming the table size as the smallest prime number greater than the input size, hash the following keys: [54, 26, 93, 17, 77, 31, 44, 55, 20]. To handle collision, use (i) linear probing and (ii) quadratic probing. Draw the hash table for each insertion. Which of the two methods has less number of total probes?   12M

OR

2. a) Explain load factor and rehashing techniques in hashmap.   6M

    b) What is a Dictionary? Explain the operations performed on a Dictionary. Describe the various ways in which a Dictionary can be implemented.   6M

UNIT–II

3.   Consider the following skip list.
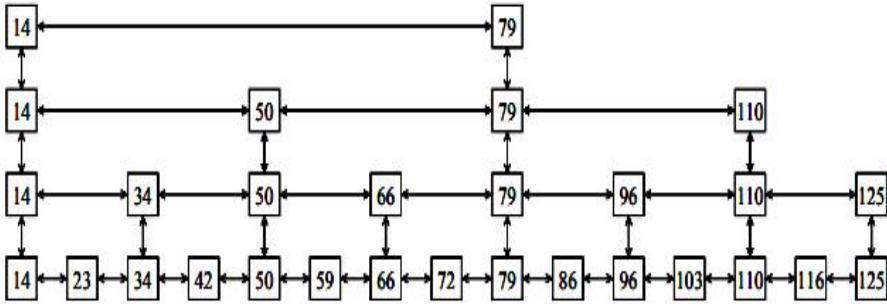
i) With neat diagram, explain how search operation for 72 is performed.
ii) With neat diagram, explain how a new element 90 is inserted.
iii) Determine the height of the skip list before and after the insertion of 90.   12M

OR

4.   Describe the probabilistic analysis of Skip List for insert, search and space usage?   12M

UNIT–III

5. a) Define 2-3 tree. List all 2-3 tree properties.   4M

    b) Show the tree that results from inserting the values 5, 21, 8, 63, 69, 32, 7, 19, 25, 10, 16, 38, 91 into an initially empty 2-3 tree. Show the tree after each insertion.   8M

OR

6. a) With an example, explain how insertion, deletion and search operations are carried out in B-Tree.   6M

    b) Compare AVL Tree, Red-Black Tree and B-Tree.   6M

UNIT–IV

7.   Describe Brute force pattern matching technique with an example, write the algorithm and analyze its time complexity.   12M

OR

8. a) Illustrate the applications of Tries. Distinguish between the standard Tries and   6M

Compressed Tries.

b) Explain about Huffman Coding Algorithm   6M

9.   With an example, explain how Priority search tree is constructed and various
     operations are performed in it.   12M

OR

10. a) What is computational geometry? What are the wide areas where such field is used?   6M

     b) Distinguish between one dimensional and two dimensional range searching?   6M

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M.Tech. I Semester Regular Examinations February 2020
Data Analytics
(Computer Science and Engineering)

Max. Marks: 60   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)
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			Marks	CO	BL

UNIT–I

1.	a)	Analyze six phases of Data Analytics life cycle	8M	1	4
	b)	Classify characteristics of Big Data	4M	1	2

OR

2.		Interpret various exploratory data analysis methods in statistics	12M	1	2

UNIT–II

3.		Find out two clusters centroids for the following data using k-means algorithm for the following points:		2	3
		(2,1), (4,1), (6,9), (7,6), (8,8), (4,5),(6,6),(10,10),(7,2)	12M		

OR

4.	a)	Analyze apriori algorithm with transactional data	10M	2	3
	b)	What is meant by over fitting	2M	2	2

UNIT–III

5.	a)	What is meant by classification? Illustrate	8M	3	2
	b)	Analyze logistic regression and their application	4M	3	2

OR

6.	a)	Compare and contrast over fitting and under fitting	5M	3	2
	b)	Analyze linear and multiple linear regression	7M	3	4

UNIT–IV

7.	a)	Interpret Term Frequency – Inverse Document Frequency(TFIDF)	6M	4	4
	b)	Explain categorization of document by topics	6M	4	2

OR

8.		Explain ARIMA model	12M	4	2

UNIT–V

9.		What are various advantages of Hadoop system and explain them	12M	5	2

OR

10.	a)	Explain about SQL essentials in detail	6M	5	2
	b)	Analyze MAP reduction	6M	5	4

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R-19

Code: 19B511T

M.Tech. I Semester Regular Examinations February 2020
Mathematical Foundations of Computer Science
(Computer Science and Engineering)

Max. Marks: 60   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)
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			Marks	CO	BL

UNIT–I

1.	a)	Identify the converse, inverse and contra positive for the Proposition P Q	6M	1	2
	b)	Find DNF of P ((P Q) ~ (~Q ~P))	6M	2	1

OR

2.	a)	Differentiate between PDNF and PCNF with two examples?	6M	3	3
	b)	Identify whether (P Q) ~R is a tautology or not?	6M	4	4

UNIT–II

3.	a)	Define a relation? Explain the properties of relations and the operations on relations?	6M	2	1
	b)	What is partial order set and construct Hasse diagram for positive divisors of 36?	6M	4	4

OR

4.	a)	Define Lattice and explain its properties.	6M	2	2
	b)	Differentiate between Partial order set and equivalence relation.	6M	4	3

UNIT–III

5.	a)	Solve the recurrence relation $a_n-6a_{n-1}+8a_{n-2}=9$, $n>=2$,$a_0=10$, $a_1=25$ by using generating function?	6M	5	4
	b)	Solve the recurrence relation $an-9a_{n-1}+26a_{n-2}+24a_{n-3}=0$, $n>=3$, $a_0=0$, $a_1=1$, $a_2=10$	6M	3	3

OR

6.	a)	Solve the recurrence relation $a_n-7a_{n-1}+10a_{n-2}=0$ $n>=2$,$a_0=10$, $a_1=41$	6M	3	3
	b)	Solve the recurrence relation $a_{n+1}=8a_n$, $n>=0$ where $a_0=4$.	6M	5	4

UNIT–IV

7.	a)	Describe Prim's Algorithm for minimum spanning tree.	6M	4	3
	b)	Analyze Breadth First Search Algorithm with appropriate example.	6M	4	4

OR

8.	a)	Discuss about different tree traversal algorithms with suitable examples.	6M	4	3
	b)	Differentiate between Depth First Search and Breadth First Search Algorithms.	6M	4	4

UNIT–V

9.	a)	Interpret about Turing Machine in the context of Modeling Computations.	6M	5	5
	b)	Differentiate between Languages and Grammars wit suitable example.	6M	5	4

OR

10.	a)	Define and differentiate between Moore machine and Melay Machine.	6M	5	5
	b)	What is Language recognition and give an example.	6M	5	4

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R-19

Code: 19B51AT

M.Tech. I Semester Regular Examinations February 2020
Machine Learning
(Computer Science and Engineering)

Max. Marks: 60   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)
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UNIT–I

1. a) Define Machine Learning. Describe the Steps in Designing learning system.   6M

    b) Explain discovering graph structure with an example.   6M

OR

2. a) List out applications of Machine Learning with brief description.   6M

    b) Explain Parametric models for classification and regression.   6M

UNIT–II

3. Discuss Least square and nearest neighbors approaches for prediction.   12M

OR

4. Explain Statistical Model for the Joint distribution with suitable example.   12M

UNIT–III

5. What are the different types of clustering algorithms? Explain any one in detail.   12M

OR

6. Discuss archetypal analysis multidimensional scaling the Google Page Rank algorithm.   12M

UNIT–IV

7. a) Explain in brief Bayesian variable selection model.   6M

    b) Explain optimality conditions for lasso regularization.   6M

OR

8. Explain Compressed sensing image inpainting and denoising.   12M

UNIT–V

9. Explain in detail about deep belief networks with two hidden layers and tied weights that is equivalent to an RBM.   12M

OR

10. What is a deep auto-encoder? Explain with suitable example.   12M

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Code: 19BE11T

M.Tech. I Semester Regular Examinations February 2020
Research Methodology and IPR
(Common to All Branches)

Max. Marks: 60   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1. Explain the characteristics of a good research problem?

OR

2. Elucidate the different types of Data collection process.

UNIT–II

3. Explain the various types of research reports.

OR

4. Elucidate the format of writing a good research report.

UNIT–III

5. Elucidate the Patent Process.

OR

6. Explain the procedure for grants of Patents.

UNIT–IV

7. Elucidate the patent information and databases.

OR

8. Elucidate the scope of patent rights.

UNIT–V

9. Elucidate the IPR of Biological systems and Computer software.

OR

10. How to administrating patent system.

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