H.T No: | | | | | | | | | | | **R18** **Course Code: B30501**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: ADVANCED DATA STRUCTURES

(Computer Science & Engineering)

Date: 20.03.2023 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. What is hashing? And explain the different methods to calculate hash function. 4M
2. Explain skip list with an example. 4M
3. Explain 2-3 with example. 4M
4. Write Knuth-Morris-Pratt pattern matching algorithm. 4M
5. Demonstrate k-D tree in detail. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Insert the following list of elements into the hash table using linear probing (size of the hash table is 10) 36,48,66,27,23,87,10, 12. 10M

OR

6. B). Demonstrate the following: i) separate chaining and ii) Double hashing. 10M

7. A). What is skip list? And explain skip list representation in detail. 10M

OR

7. B). Describe the deterministic lists in detail. 10M

8. A). Construct a binary search tree for the given data 3,1,4,6,9,2,5,7 ? and Also explain deletion of a node with two children's. 10M

OR

8. B). Compare various search trees or splay trees. 10M

9. A). Compare and contrast various tries. 10M

OR

9. B). Demonstrate longest common subsequence with example. 10M

10. A). Discuss the following: i) Range tree and ii) Quad tree. 10M

OR

10. B). Explain the priority search tree with example. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: B30502**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(Computer Science & Engineering)

Date: 23.03.2023 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. Show that $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$ is a Tautology using truth table. 4M
2. Explain properties of relations with examples. 4M
3. Define recursive algorithm with an example. 4M
4. Find the recurrence relation for the Fibonacci sequence. 4M
5. Define Hamiltonian circuit with an example. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Explain the principal disjunctive and principal conjunctive normal forms and obtain the principal disjunctive normal form of $(P \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R)$. 10M

OR

6. B). List the rules of inference. Show that $\neg (P \wedge Q)$ follows from neg $P \wedge \neg Q$ using rules of inference. 10M

7. A). Define (i) Sub lattice, (ii) Lattice homomorphism, (iii) Complete lattice and (iv) Distributive lattice. 10M

OR

7. B). Define the following properties of binary relation with suitable examples reflexive, symmetric, transitive, irreflexive and anti-symmetric. 10M

8. A). Prove $n^3 - n$ is divisible by 3 for all positive integers. P(n): $n^3 - n$ is divisible by 3. 10M

OR

8. B). Explain recursive algorithm with suitable examples. 10M

9. A). Explain the Bayes' theorem with an example. 10M

OR

9. B). Solve the recurrence relation $a_n = a_n - 1 + 3$ n where $a_0 = 1$ by substitution method. 10M

10. A). Prove that a connected plane graph with 7 vertices and degree(V) = 4 for each vertex V of G must have 8 regions of degree 3 and one region of degree 4.? 10M

OR

10. B). A complete binary tree has 125 leaves. How many vertices does it have? 10M

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H.T No: | | | | | | | | | | | R18 Course Code: B30505

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: MACHINE LEARNING

(Computer Science & Engineering)

Date: 25.03.2023 FN Time: 3 hours Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. 5x4=20M

1. Define Machine Learning. Explain with specific examples. 4M
2. Define Artificial Neural Networks. Explain Biological learning systems. 4M
3. List and explain features of Bayesian learning systems. 4M
4. What is Classification? How it is different from Clustering? 4M
5. Compare Inductive learning and Analytical learning. 4M

PART-B

Answer the following. Each question carries TEN Marks. 5x10=50M

6. A). Define Decision Tree Learning. List and explain appropriate problems for decision tree learning. Describe Hypothesis space search in decision learning. 10M

OR

6. B). List and explain issues in decision tree learning. Give the differences between the hypothesis space search in ID3 and candidate elimination algorithm. 10M

7. A). What is multi-layer perceptron (MLP)? How is it trained using back propagation? What is the role of hidden layer? 10M

OR

7. B). Define Perceptron. Derive the back propagation algorithm for neural network training. 10M

8. A). What is instance-based learning? Describe k-nearest neighbour (KNN) algorithm. 10M

OR

8. B). Explain how Naïve Bayes algorithm is useful for learning and classifying text. 10M

9. A). State and explain different techniques used for pattern comparison. 10M

OR

9. B). Explain Hidden Markov Models (HMM) in details. 10M

10. A). Briefly describe about Explanation-Based Learning. 10M

OR

10. B). Discuss about Inductive-Analytical Approaches to Learning. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: B30509**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: INFORMATION RETRIEVAL SYSTEMS

(Computer Science & Engineering)

Date: 27.03.2023 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. A) How is browsing different from Searching? 2M
   B) Write the assumptions of vector space model. 2M
2. A) Discuss efficiency uses in clustering. 2M
   B) Explain Precision and Recall. 2M
3. A) Write a short note on pattern matching. 2M
   B) How Inverted file is useful in information retrieval? 2M
4. Explain the standard model of the information access processes with a neat diagram. 4M
5. Write short notes on Automatic Feature Extraction 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Explain in detail about Probabilistic model and briefly describe Simple term weights with an example. 10M

OR

6. B). Explain the structural Retrieval Models. 10M

7. A). Explain and compare the different compression techniques. 10M

OR

7. B). Explain vector space relevance feedback process with an example. 10M

8. A). Explain the implementation of inverted files and signature files with an example. 10M

OR

8. B). Briefly explain a web search engine. 10M

9. A). Write a short note on Query specifications. 10M

OR

9. B). Write a short note on information access process. 10M

10. A). Explain in detail about generic multimedia indexing approach. 10M

OR

10. B). Explain in detail about two dimensional color images. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: B30212**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: RESEARCH METHODOLOGY & IPR

(Common for all Branches)

Date: 29.03.2023 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. What are the qualities of a good researcher? 4M
2. Name the basic principles of research ethics. 4M
3. Write three precautions for writing research report. 4M
4. Explain about trademark. 4M
5. Write the advantages about trade secrets law. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). What do you mean by research? Explain its significance in modern times. 10M

OR

6. B). "Research is much concerned with proper fact finding, analysis and evaluation". Do you agree with this statement? Give reasons in support of your answer. 10M

7. A). Write the principles of ethics in science and engineering Research? 10M

OR

7. B). What are the major issues in conducting research? Explain with example. 10M

8. A). Explain the layout of research paper enumerating the various fields in it. 10M

OR

8. B). Write the different types of reports, particularly pointing out the difference between a technical report and a popular report. 10M

9. A). Discuss some of the important considerations when commercializing intellectual property. 10M

OR

9. B). State the provisions for procedure of registration and assignment of a copyright. 10M

10. A). List at least 10 geographical indications tagged products in India. 10M

OR

10. B). Explain new developments in the copyright protection following: Computer programs and Videogames. 10M

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