CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular/Supplementary Examinations August-2023
Course Name: BUSINESS ETHICS & CORPORATE GOVERNANCE
(Common for EEE, ECE, CSE, IT, CSC, CSM, CSD, AID & AIM)

Date: 07.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Can business ethics be taught and trained?	2 M
2.	Write in short about moral development.	2 M
3.	Ethics in HRM.	2 M
4.	Ethics of health care services.	2 M
5.	Cyber space.	2 M
6.	Ethical dimensions of cyber crimes.	2 M
7.	Does good governance really matters to corporations?	2 M
8.	Write in short about Board committees.	2 M
9.	Corporate risk.	2 M
10.	Effective corporate governance frame work.	2 M

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

11.A).	Discuss the five myths about business ethics.	10M
	OR	
11. B).	Explain the kohlberg's study and carol Gilligan's theory.	10M
12. A).	Explain the ethics of finance and accounting professionals.	10M
	OR	
12. B).	Elaborate the concept of ethics of media marketing and ethical dilemma.	10M
13. A).	Discuss the social, political issues in the cyber space.	10M
	OR	
13. B).	Discuss mindset and skills of hackers and other criminals.	10M
14. A).	Explain the corporate governance in India-board structures.	10M
	OR	
14. B).	Explain the process and evaluation of corporate governance.	10M
15. A).	Discuss role of corporate governance in managing the risks.	10M
	OR	
15. B).	Explain the internal auditing's role in corporate governance.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: IMAGE PROCESSING

(Common for CSE, IT, CSC, CSM, CSD, AID & AIM)

Date: 07.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. What is meant by sampling and quantization in an image?   2 M
2. Find the 2D-DCT of the matrix $f(m, n) = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.   2 M
3. What do you mean by point processing?   2 M
4. Define spatial filtering.   2 M
5. Draw the block diagram of degradation model and write the equation for it.   2 M
6. What is meant by point spreading function in image degradation?   2 M
7. Why Laplacian of gaussian edge detector is preferred than other edge detectors?   2 M
8. What is a hit-or-miss transform?   2 M
9. What is the need for image compression?   2 M
10. Mention the classification of image compression methods.   2 M

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

11.A). Explain various neighbors, adjacency and distance measure between the pixels.   10M

OR

11. B). i) Mention the different properties of 2D-DFT.Explain any two of them.   6M
ii) Compute the Hadamard Transform matrix for N=4.   4M

12. A). Justify the statement "Median filter is an effective tool to minimize salt-and –pepper   10M
noise" with suitable example

OR

12. B). i) Discuss about ideal high pass and Butter worth HPF.   6M
ii) What is meant by image sharpening? Mention its types.   4M

13. A). Explain inverse filter used in image restoration. Mention its drawbacks.   10M

OR

13. B). Explain the iterative method of image restoration. Mention its advantages.   10M

14. A). i) Explain about thresholding technique in image segmentation.   5M
ii) Explain how regions are growing in region-based segmentation.   5M

OR

14. B). i) Write the algorithms for Dilation and Erosion operations in image morphology. 5M
ii) Mention the properties of opening and closing operations in image morphology.   5M

(P.T.O..)

15. A).   A source emits four symbols {a, b, c, d} with the probabilities {0.4,0.2,0.1,0.3}. Construct   10M
arithmetic coding and decode the word 'DAD'.

OR

15. B).   Explain lossy predictive coding with suitable example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular/Supplementary Examinations August-2023
Course Name: INTRODUCTION TO DATA SCIENCE
(Common for ECE, CSE, IT, CSC, CSM & AIM)

Date: 07.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Elaborate the concept of Big Data.	2 M
2.	Explain the concept of NumPy in Python.	2 M
3.	Define the term Visualization of data.	2 M
4.	Distinguish between Bar Charts and Line Charts.	2 M
5.	Explain the importance of Naïve Bayes.	2 M
6.	Illustrate the concept of K- nearest Neighbors Classifications with suitable example.	2 M
7.	Briefly elaborate the importance of Deep Learning.	2 M
8.	Examine the Induction rule in brief.	2 M
9.	Demonstrate the application of Data Science in Weather Forecasting.	2 M
10.	Analyze implementation of Data Science in the Stock Market.	2 M

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

11.A).	Explain about Matplotlib Python Programing tool kit for data science.	10M
	OR	
11. B).	Classify the important concepts of Web Scraping.	10M
12. A).	Explain about Bar charts and line charts with suitable diagrams.	10M
	OR	
12. B).	Compare and contrast the differences between Cleaning and Munging techniques.	10M
13. A).	Compare and contrast the differences between Supervised and Unsupervised Learning.	10M
	OR	
13. B).	Distinguish between Support Vector Machine and Logic regression.	10M
14. A).	Outline the concept of Decision trees and random forest.	10M
	OR	
14. B).	Interpret the concept of Neural Networks for problem solving.	10M
15. A).	Illustrate the applicability of Object Recognition in Data Science with suitable example.	10M
	OR	
15. B).	Classify the importance of Real Time Sentiment Analysis.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations August-2023
Course Name: MATHEMATICS FOR MACHINE LEARNING
(Common for AID & AIM)

Date: 09.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	What is Rank of a Matrix?	2 M
2.	Define Manhattan Norm.	2 M
3.	What do you mean by Eigenspace?	2 M
4.	Give an example of Taylor Series.	2 M
5.	Compare global minimum and local minimum.	2 M
6.	Write about Feature Map.	2 M
7.	What is Marginal Likelihood?	2 M
8.	Discuss about Principal Subspace computation.	2 M
9.	What is the use of mixture model?	2 M
10.	What is soft margin SVM?	2 M

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

11.A). Discuss solving systems of linear equations and give an example for calculating an   10M
Inverse Matrix by Gaussian Elimination.

OR

11. B). Compute the distance between   10M

$$x = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}, \quad y = \begin{bmatrix} -1 \\ -1 \\ 0 \end{bmatrix}$$

using

a. $\langle x, y \rangle := x^\top y$

b. $\langle x, y \rangle := x^\top A y, \quad A := \begin{bmatrix} 2 & 1 & 0 \\ 1 & 3 & -1 \\ 0 & -1 & 2 \end{bmatrix}$

12. A). Write down the steps for computing singular value decomposition and find SVD of   10M
$A = \begin{bmatrix} 3 & 2 & 2 \\ 2 & 3 & -2 \end{bmatrix}$.

OR

12. B). Discuss about backpropagation and automatic differentiation.   10M

(P.T.O..)

13. A). What is Gradient Descent? Compare and contrast Gradient Descent with Momentum and Stochastic Gradient Descent.   10M

OR

13. B). Explain how Regularization can be applied to reduce Overfitting problem using an example?   10M

14. A). Why do we need Maximum Likelihood estimation? Describe a geometric interpretation of Maximum Likelihood estimation as Orthogonal Projection.   10M

OR

14. B). Illustrate and discuss the key steps of PCA in practice and its applications.   10M

15. A). Explain EM algorithm for estimating the parameters of a GMM in detail.   10M

OR

15. B). What do you mean a kernel? Explain different kernel types with suitable examples in SVM.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular & Supplementary Examinations August-2023

Course Name: DESIGN & ANALYSIS OF ALGORITHMS
(Common for CSE, IT, CSM, AID & AIM)

Date: 11.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	How can we measure an algorithm's running time?	2 M
2.	Define O-notation? Give one Example.	2 M
3.	Find an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits (10, 5, 7, 11) and weight are (3, 4, 3, 5).	2 M
4.	State the Job – Sequencing Deadline Problem?	2 M
5.	Give problem statement of graph coloring.	2 M
6.	State the difference between FIFO and LC Branch and Bound algorithms.	2 M
7.	Differentiate between breadth first search and Depth first search.	2 M
8.	Give the problem statement of Prim's method and write Time complexity of Prim's Algorithm?	2 M
9.	Differentiate between P and NP Classes.	2 M
10.	Define NP Hard.	2 M

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

11.A). Using iteration method.   10M
 i) Solve $T(n)=2T(n/2)+2$ if n>2
                $=1$ if n=2
 ii) Solve $T(n)=2T(\sqrt{n})+\log n$

OR

11. B). Solve using Masters theorem: 10M
 i) $T(n)=2T(n/4)+n$
 ii) $T(n)=7T(n/2)+n^2$

12. A). Construct the Huffman tree & resulting code word for the following set of values? Encode the words DAD &ADD.   10M

Character	A	B	C	D	--
Probability	0.35	0.1	0.2	0.2	0.15

OR

12. B). Let the dimensions of A,B,C,D respectively be 10X5, 5X15, 15X8, 8X20 generate matrix product chains that produces minimum number of matrix multiplications using dynamic programming.   10M

(P.T.O..)

13. A). Write an algorithm to determine the Hamiltonian cycle in a graph using backtracking.   10M

OR

13. B). Explain the FIFO BB 0/1 Knapsack problem procedure with the knapsack instance for   10M
n=4, m=15, (p1,p2,p3,p4)=(10,10,12,18), (w1,w2,w3,w4) =(2, 4, 6, 9). Draw the portion
of the state space tree and find optimal solution.

14. A). Consider the following graph. If there is ever a decision between multiple neighbor nodes   10M
in the BFS or DFS algorithms, assume we always choose the letter closest to the
beginning of the alphabet first. In what order will the nodes be visited using a Breadth
First Search and Depth First Search with start vertex as 0?
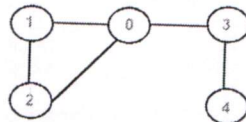
OR

14. B). Write down Kruskal's Algorithm for finding the Minimum Spanning Tree of a connected   10M
graph. Execute your algorithm on the following graph.
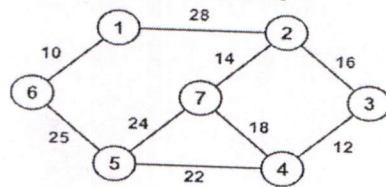
15. A). i) Define NP- Hard and NP – Complete Problems.
ii) What are the steps used to show a given problem is NP-Complete?   5M
                                                                                      5M

OR

15. B). i) Explain Satisfiability problem
ii) Explain min-max Search with suitable example.   5M
                                                                                      5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular Examinations August-2023
Course Name: ARTIFICIAL INTELLIGENCE
(Common for AID & AIM)

Date: 14.08.2023 AN　　　　　Time: 3 hours　　　　　Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.　　　　　　10x2=20M

1.	List the four approaches of Artificial Intelligence	2 M
2.	State incompleteness theorem.	2 M
3.	Define Problem Formulation.	2 M
4.	What is local beam search?	2 M
5.	List out types of local search for CSP.	2 M
6.	Define min-max algorithm.	2 M
7.	Recall propositional logic.	2 M
8.	State forward chaining	2 M
9.	List out the components of well defined problem.	2 M
10.	Define conditional probability.	2 M

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

11.A).	Elaborate the history of Artificial Intelligence.	10M
	OR	
11. B).	Illustrate in detail about the structure of agents.	10M
12. A).	Discuss in detail about uniformed search strategies.	10M
	OR	
12. B).	Explain the local beam search in detail with an example.	10M
13. A).	Evaluate how to solve constraints satisfaction problem with local search algorithm.	10M
	OR	
13. B).	Evaluate how to achieve optimal decisions in multiplayer games.	10M
14. A).	Analyze the process of constructing a knowledge-base in first-order logic.	10M
	OR	
14. B).	Analyze the working of agents based on propositional logic in detail.	10M
15. A).	Implement the algorithm for planning with state space search.	10M
	OR	
15. B).	Apply the model of Bayesian networks in artificial intelligence.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular/Supplementary Examinations August-2023
Course Name: DATABASE MANAGEMENT SYSTEMS
(Common for CSM & AIM)

Date: 16.08.2023 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1. Classify different levels of data abstraction.   2 M
2. Define attribute? Give examples.   2 M
3. What is a View? Explain with example.   2 M
4. How would you disallow null values into the database?   2 M
5. Write a short note on relational algebra.   2 M
6. Define Normal forms. Expand the term BCNF.   2 M
7. Illustrate Serializability.   2 M
8. Define time stamp based protocols.   2 M
9. Differentiate Extendible vs. Linear Hashing.   2 M
10. Define Indexing. Write the types of Indexing.   2 M

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

11.A).   i) Discuss the various disadvantages in the file system and explain how it can be overcome by the database system.   5M

ii) What is Entity Relationship Model? Explain the major constructs of ER model with examples.   5M

OR

11. B).   i) Draw and explain the detailed system architecture of DBMS.   5M

ii) What are the various symbols used to draw an E-R diagram? How weak entity sets and strong entity sets are represented in an E-R diagram? Illustrate with an example.   5M

12. A).   i) Explain about specifying foreign key constraints in SQL with an example.   5M
ii) Consider the following relations: 5M
Sailors (sid, sname, rating, age)
Boats (bid, bname, color)
Reserves (sid, bid, day)
Write the statements in SQL for the following questions.
a) Find the names of sailors who have reserved a Red boat.
b) Find the names of sailors who have reserved at least one boat.
c) Find the names of sailors who have reserved a Red and a Green boat.
d) Find the names of sailors who have reserved a Red or a White boat.
e) Find the names of sailors who have reserved all boats.

OR

12. B).   i) Describe the concept of Referential Integrity.   4M
ii) Write short notes on the following: 6M
a) Joins   b) Nested queries.

(P.T.O..)

13. A). i) Differentiate between tuple relational calculus and domain relational calculus.   3M
ii) What is Normalization? Explain 1st NF, 2nd NF and 3rd NF with suitable examples.   7M

OR

13. B). i) List and explain the five basic operators of relational algebra with an example each.   5M
ii) Distinguish between 3NF and BCNF.   5M

14. A). i) Define transaction and explain desirable properties of transaction.   5M
ii) Explain the differed and immediate modification versions of the log-based recovery scheme.   5M

OR

14. B). i) Define Serializability. Categorize various types of Serializability with suitable examples.   5M

ii) Write a short note on timestamp based protocol.   5M

15. A). i) Describe the different types of file organizations? Explain each of them with their advantages and disadvantages.   5M

ii) Is B+ tree, a multi-level indexing? How does it differ from B-tree?   5M

OR

15. B). i) Explain Clustered index organization with an example.   5M
ii) Discuss insert, delete, search operations on and B+ trees.   5M

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