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 noise" with suitable example   10M

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/Supplementary Examinations August-2023

Course Name: PYTHON PROGRAMMING

(Common for EEE, ME, ECE, CSE, IT, CSC & CSM)

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.	Identify the difference between the if, if-else, if-elif-else statements.	2 M
2.	Outline the Characteristics of functions and modules.	2 M
3.	What are local variable and how they are used?	2 M
4.	Show the need of Void function.	2 M
5.	Summarize about two dimensional Lists.	2 M
6.	Discuss the need of Recursion.	2 M
7.	Determine the Benefits of Instances.	2 M
8.	Distinguish between Classes and Objects.	2 M
9.	Classify the need of Turtle graphics.	2 M
10.	How to use Widgets in python?	2 M

PART-B

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

11.A). i) Identify the most Commonly used Repetition structures in Python   5M

ii) Write a Python program to convert height in feet and inches to cm. [1 feet = 12 inch and 1 inch= 2.54 cm] (Sample input: 2 feet 7 inch Sample output: 78.74 cm)   5M

OR

11. B). Summarize various operators, built-in functions and standard library modules that deals with python numeric type.   10M

12. A). i) Outline the declaration and calling of functions in Python? Illustrate with an example.   5M

ii) Demonstrate the process of storing functions in Modules.   5M

OR

12. B). i) Write a Python program to print all prime numbers less than 256 using Functions   5M

ii) What type of parameter passing is used in Python? Justify your answer with sample programs.   5M

13. A). i) Demonstrate the process finding items in Lists with the in Operator.   5M

ii) Illustrate a Python program that counts the number of occurrences of a letter in a string, using dictionaries.   5M

OR

13. B). i) What is a list in Python? How to create nested lists? Demonstrate how to create and print a 3-dimensional matrix with lists.   5M

ii) Write a python program to convert 'a, e, i, o, u' letters in a string with 'w, x, y, z, p' using string translate method.   5M

(P.T.O..)

14. A).   i) Classify the Techniques for Designing Classes.   5M

           ii) Elaborate the implementation of hierarchical inheritance in Python, with a program.   5M

<div align="center">OR</div>

14. B).   i) Construct a python program to show the polymorphism in Python.   5M

           ii) How does Instances are created in python show with an example?   5M

15. A).   i) Can you categorize the different widgets in GUI designing.   5M

           ii) Show the implementation of two dimensional shapes.   5M

<div align="center">OR</div>

15. B).   i) Elaborate the implementation of Radio Buttons, labels and Check Buttons in Python.   5M

           ii) How to Develop a python program to show Button widgets and Info Dialog boxes?   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech IV Semester Regular/Supplementary Examinations August-2023
Course Name: MACHINE LEARNING
(CSM)

| 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 unsupervised learning? Name some algorithms.   2 M
2. What is univariate Linear Regression?   2 M
3. List the differences between bias and variance.   2 M
4. Discuss the role of Bayes-Optimality in model selection.   2 M
5. Name some algorithms that are used for Dimensionality Reduction.   2 M
6. How is KNN different from K-means Clustering?   2 M
7. When should you use classification over regression? Explain with an example.   2 M
8. Write the equation of cost function in logistic regression.   2 M
9. What are feedforward and backpropagation algorithms?   2 M
10. Mention the importance of confusion matrix.   2 M

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

11.A). What is Linear Regression? Explain in detail using example and list all the assumptions to be met before starting the Linear Regression.   10M

OR

11. B). Write a short note on Model Selection and Generalization.   10M

12. A). What are the kernels in SVM? Explain popular kernels used in SVM along with their applications.   10M

OR

12. B). Discuss the k-nearest neighbor learning classification with an example and also discuss its remarks.   10M

13. A). What is the main purpose of principal component analysis? Explain.   10M

OR

13. B). What do you understand by curse of dimensionality? Explain Linear Discriminant Analysis (LDA) for feature extraction.   10M

14. A). What is a Decision Tree Learning? Explain how decision tree is represented with a neat diagram?   10M

OR

14. B). With an example explain how Gradient Descent algorithm is used to train the machine learning models and neural networks. Mention its advantages and disadvantages.   10M

(P.T.O..)

15. A). Explain the similarity and differences between bagging and boosting techniques with relevant examples. 10M

OR

15. B). Explain the backpropagation algorithm in training neural networks. 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   2 M
   m=15, profits (10, 5, 7, 11) and weight are (3, 4, 3, 5).
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   2 M
   Algorithm?
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   10M
   the words DAD &ADD.

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   10M
   product chains that produces minimum number of matrix multiplications using dynamic
   programming.

(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 $n=4$, $m=15$, $(p1,p2,p3,p4)=(10,10,12,18)$, $(w1,w2,w3,w4) =(2, 4, 6, 9)$. Draw the portion of the state space tree and find optimal solution.   10M

14. A). Consider the following graph. If there is ever a decision between multiple neighbor nodes 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?   10M
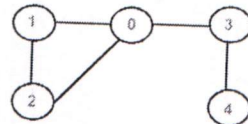
OR

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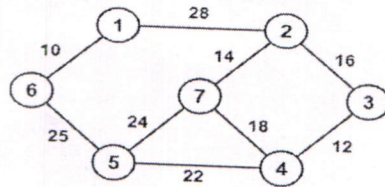
15. A). i) Define NP- Hard and NP – Complete Problems.   5M
ii) What are the steps used to show a given problem is NP-Complete?   5M

OR

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

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

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. Differentiate between time sharing and multiprogramming systems.   2 M
2. List the various services provided by an operating system.   2 M
3. Sketch the process control block with its components.   2 M
4. Define Processor affinity and give its types.   2 M
5. State the four necessary conditions for a deadlock situation to arise.   2 M
6. What is race condition?   2 M
7. Consider a logical address space of 8 pages of 1024 words each, mapped onto a physical memory of 32 frames.   2 M
   How many bits are there in the physical address and logical address respectively?
8. Differentiate between internal fragmentation and external fragmentation.   2 M
9. Identify the purpose of the following system calls with respect to file system implementation: 2 M
   a) ioctl()   b) lseek()
10. What is demand paging?   2 M

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

11.A). Explain the components of a computer system with a neat block diagram and discuss the role of operating system from the user and system point of view.   10M

OR

11. B). Explain the classification of system calls with its functions.   10M

12. A). i) Show the queueing diagram representation of process scheduling.   5M
   ii) Show the classification of multithreading models with neat diagrams and explain the thread cancellation scenarios.   5M

OR

12. B). Consider the following set of processes, with the length of the CPU-burst time given in milli seconds: 10M

Process	Burst Time
P1	10
P2	1
P3	2
P4	5

i) Draw the Gantt's chart illustrating the execution of these processes using FCFS, SJF and Round Robin (with quantum= 1) scheduling techniques.
ii) Find the turnaround time and waiting time of each process using the above techniques.

(P.T.O..)

13. A). Examine how semaphore is used to provide a solution for the dining-philosophers 10M
    problem that ensures freedom from deadlocks.

OR

13. B). Show how deadlock can be determined using resource allocation graph with suitable 10M
    examples and its algorithmic representation.

14. A). Consider five memory partitions of size 100 KB, 500 KB, 200 KB, 450 KB and 600 KB 10M
    in same order. If sequence of requests for blocks of size 212 KB, 417 KB, 112 KB and
    426 KB in same order come, then which of the following algorithm makes the efficient
    use of memory?
    i) Best fit algorithm
    ii) First fit algorithm
    iii) Worst Fit algorithm

OR

14. B). Consider the Pages referenced by the CPU in the order are   10M
    6, 7, 8, 9, 6, 7, 1, 6, 7, 8, 9, 1
    Identify the number of page faults would occur for the following replacement algorithms,
    assuming the number of page frames as three and four.
    Remember all frames are initially empty, so your first unique pages will all cost one fault
    each.
    i) LRU replacement
    ii) FIFO replacement
    iii) Optimal replacement

15. A). Explain any two schemes used for defining the logical structure of a directory with its 10M
    advantages and disadvantages.

OR

15. B). Explain any two types of file allocation methods that are used for effective utilization of 10M
    disk space and for faster accessing of files with neat diagrams.

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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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