MGM UNIVERSITY
University Department of Information and Communication Technology
CA II EXAMINATION – April 2024

COURSE: B.Tech in AIML   **Sem:** IV   **Class Test:** CA2

Subject Name: Convex Optimization   **Subject Code:** BTAM2204

Date: 04/04/2024   **Total Marks:** 10

Note: All questions are Compulsory.

Q1.	Solve any two of the following Questions (5 Marks each)	CO	Level
1.	Using Newton Raphson Method approximate the roots of the given real valued function if $x_0 = 2$. iterate for x_1, x_2 $\quad\quad F(x) = x^3 - 4x + 1$ Show steps clearly	CO4	3
2.	Use Lagrange multipliers to find the maximum and minimum values of function f(x) subject to the given constraint. $F(x,y) = 8x^2 - 2y$ Subject to : $x+y=1$	CO4	3
3.	Write the steps of Simplex Algorithm and its role in Linear optimization.	CO3	2

4.	Write short notes on (Any two)
	    a) KKT Conditions
	    b) Newton Raphson method
	    c) Semi definite Programming
		CO3	2

Course: SY IT/ AIML/DS   **Sem: IV**

Subject Name: DBMS   **Subject Code: BTIT2205**

Max Marks: 10   **Date: 04/03/2024**   **Duration:- 1 Hr.**

Q	Solve the following questions (any 2). Each question carries 5 Marks.	CO
1	Enlist and explain join types with suitable examples.	C01
2	Given below are a few examples of a database and a few queries based on that. Suppose there is a banking database which comprises following tables: Customer (Cust_name, Cust_street, Cust_city) Branch (Branch_name, Branch_city, Assets) Account (Branch_name, Account_number, Balance) Loan (Branch_name, Loan_number, Amount) Depositor (Cust_name, Account_number) Borrower (Cust_name, Loan_number) a) Find the names of all the customers who have taken a loan from the bank and also have an account at the bank. b) To rename the first attribute of the table Depositor with attributes P. c) Selects tuples from customer where Customer name is 'yogita' and Customer city is 'Pune'. d) Find the branches where average account balance > 1000. e) Calculate total loan amount given by bank	C02
3	Consider following table. Company as table A and Candidate as table B. Calculate the following. Write output table for a) A ⋈ B b) A ⋈ B c) A ⋈ B	C02
4	1. Calculate a natural join for following and also write SQL queries for the same.	C03

Table for Question 3:

Company

CID	Cname
1	DELL
2	HP
3	IBM
4	Microsoft

Candidate

Candidate	FullName	CID
1	Ron	1
2	Pete	2
3	Steve	3
4	Steve	NULL
5	Ravi	1
6	Raj	3
7	Kiran	NULL

MGM UNIVERSITY

University Department of Information and Communication Technology

CA-II

Class: B. Tech SY (IT/AIML/DS) **Sem: IV**

Subject Name: Probability & Statistics **Subject Code:** BTIT2201

Date: 03/ 04 /2024 **Time:** 11:00 a.m. to 11:45 a.m. **Total Marks:** 10

Sr. No.	Solve any TWO of the following Questions.(Each question carries 5 Marks)	CO	Level
1	Define the following terms a) Null Hypothesis b) Alternate Hypothesis c) Level of Significance	CO4	1
2	What is a confusion matrix? Explain a) Type 1 error b) Type 2 error	CO4	2
3	Write a short note on Chi Square Test.	CO4	3
4	**A dice is thrown 9,000 times and a throw of 3 or 4 is observed 3,240 times.** Formulate Null and Alternative hypothesis for the above statement.	CO4	3

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Academic Year 2023-24	Semester-IV
Class: SY IT Div-2/ AIML/DS	Class Assessment – II
Subject: Data Structures in JAVA	Date: 03/04/2024
Duration : 1 Hr	Max Marks: 10

Instructions to the Students:
1. Illustrate your answers with neat diagrams etc. where ever necessary
2. Attempt any 2 questions

		CO	BT Level	Marks
Q1	Write Pseudo code for inserting a node in a singly linked list at end and deleting a node from start of the linked list. Display the list after operations.	3	3	5
Q2	Write Pseudo code for deleting a node from a singly linked list at the beginning and inserting node in middle. Display the list after operations.	3	3	5
Q3	Write Pseudo code for inserting a node in a doubly linked list in middle and deleting a node from start of the DLL. Display the list after operations.	3	3	5
Q4	Write Pseudo code for concatenating linked lists and display the concatenated list.	3	3	5

MGM University
University Department of Information & Communication Technology
Subject: Data Structure in JAVA
Class: SY IT₁ / IT₃ Academic year 2023-24 Part-II

CA-II   Date: 04/04/2024   Total Marks: 10   Time: 1 Hr

Q. 1 Construct a binary search tree for given sequence of elements and traverse the tree in inorder and preorder direction.

{ 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18 }

(5 Marks - CO-3 / BT-Level- 2)

OR

Q. 1 Construct a binary search tree for given sequence of elements and traverse the tree in postorder and inorder direction.

{ 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7}

(5 Marks - CO-3 / BT-Level- 2)

Q. 2 Construct a AVL tree for given sequence of elements
{ 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 2, 3, 7}

(5 Marks - CO-3 / BT-Level- 2)

OR

Q. 2 Construct a AVL tree for given sequence of elements
{ 7, 14, 2, 5, 10, 33, 56, 30, 15, 25, 66, 70, 4}

(5 Marks - CO-3 / BT-Level- 2)

15 MAY 2024/SY/UDICT/23-24/P2/CA-2

Class: SY IT/DS   **Sem: IV**

Subject Name: Digital Logic Design   **Subject Code: BTIT2203**

Date : 04/04/2024   **Maximum Marks : 10**

Que. No.	Solve any FOUR questions	CO	Marks
1	Design BCD adder using 4 bit binary adder IC 7483.	CO 2	2.5
2	Design 4 bit binary to gray code convertor.	CO 2	2.5
3	Explain 1 bit memory cell with diagram.	CO 3	2.5
4	Explain SR flip flop with diagram.	CO 3	2.5
5	Explain T flip flop with diagram.	CO 3	2.5
6	Convert JK flip flop to T flip flop.	CO 3	2.5

MGMU, UDICT, Aurangabad
Academic Year 2023-24
Part-II

Class: SY AIML Div-III

Subject: MLA

Duration : 1 Hr

CA– II

Date 04/04/ 2024

Max Marks: 10

	Solve any two question from Q1 to Q3	Marks
1	Explain Unsupervised learning process flow	3
2	Explain the use of Principal Component Analysis in machine learning	3
3	What are the limitation of K-means algorithm	3
	Solve any One question from Q4 to Q5	
4	How to find the value of K in K-means algorithm using Average Silhouette method	4
5	Explain how to build nested clusters using hierarchical clustering technique	4

Class: B.Tech SY (IT/DS)   **Sem:** II

Subject Name: AIML   **Subject Code:** BTIT2204

Date: 04/04/2024   **Time:** 01:00 a.m. to 01:45 a.m   **Total Marks:** 10

Solve any TWO of the following Questions.(Each question carries 5 Marks)	CO	Marks
What is Machine Learning? Explain its Types With an Example?	CO3	5
Explain The Working of the Following Classifiers K-Nearest Neighbors?	CO3	5
What is Noise in Machine Learning? State and Explain how to Remove Noise in Machine Learning?	CO3	5
Explain learning Association Rule ? Explain in Detail ECLAT Algorithm?	CO3	5