Seat No.: _____ Enrolment No. 102CTBMCS21[redacted]

NATIONAL FORENSIC SCIENCES UNIVERSITY

Subject Code: CTBTCSE SIII P3 **Date. 10/11/22**
Subject Name: Database Management System
Time: 11:30 – 1:00 pm **Total Marks: 50**

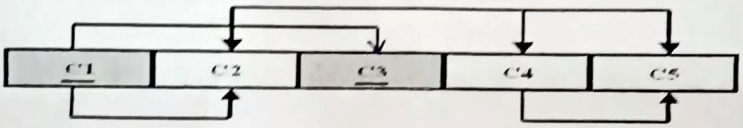
Instructions:
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Part "A"

Q-1 Describe the five components of the DBMS environment and discuss how they relate to each other. **(10)**

Q-2 Describe the relationship between a superclass and its subclass. What are the main reasons for introducing the concepts of super classes and sub classes into an ER model? **(5+5)**

Q-3. Examine the figure below & answer the following questions. **(5+5)**



What do you understand by data dependencies. What kind of dependencies are in above figure. Discuss.

Part "B"

Examine the table shown below.

Branch No	Branch Address	Tel Nos
B001	8 Jefferson Way, Portland, OR 97201	503-555-3618, 503-555-2727, 503-555-6534
B002	City Center Plaza, Seattle, WA 98122	206-555-6756, 206-555-8836
B003	14 – 8th Avenue, New York, NY 10012	212-371-3000
B004	16 – 14th Avenue, Seattle, WA 98128	206-555-3131, 206-555-4112

(a) Why is this table not in 1NF? **(6)**
(b) Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF). **(7)**
(c) Identify the primary, alternate and foreign keys in your 3NF relations. **(7)**

Seat No.: [redacted]

Enrolment No. 102CTBMCS21[redacted]

NATIONAL FORENSIC SCIENCES UNIVERSITY

B.Tech. - M.Tech. Computer Science & Engineering (Cyber Security)

Semester - III - Jan-2023

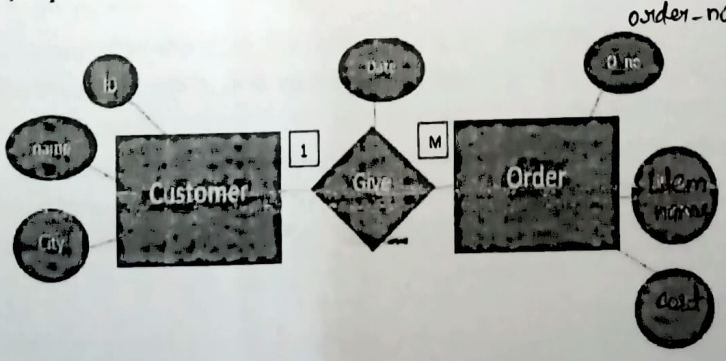
Subject Code: CTBTCSE SIII P3 **Date: 06/01/2023**

Subject Name: Database Management Systems

Time: 11:00 AM to 02:00 PM **Total Marks: 100**

Instructions:

1. **Write down each question on separate page.**
2. **Attempt all questions.**
3. **Make suitable assumptions wherever necessary.**
4. **Figures to the right indicate full marks.**

			Marks
Q.1	(a)	What is the difference between two-tier and three-tier architecture? Explain the three-tier architecture with example	05
	(b)	Discuss the purpose of logical database design	05
	(c)	Define DBMS. What is the difference between Database, Data Warehouse and Big Data System. Compare file-oriented system versus database system in detail	07
Q.2	(a)	Explain how to delete duplicate tuples in SQL with proper example	05
	(b)	What is the difference between Primary key and foreign key? Explain with suitable example	05
	(c)	What do you mean by Wildcards in SQL? Explain the different types of Wildcards in SQL with proper example	07
Q.3	(a)	An ER diagram is shown below. The relation is one to many. Identify the primary and foreign keys. Can we reduce the number of tables? If yes, explain the same 	08
	(b)	The relation schema Student_Performance (name, courseNo, rollNo, grade) has the following FDs: name, courseNo → grade rollNo, courseNo → grade	08

		name → rollNo rollNo → name **name** | **courseNo** | **rollNo** | **grade** Jay | CE | 1 | Fail Om | IT | 2 | Sup. Vishal | CE | 3 | Pass What should be the highest normal form of this relation scheme?	
Q.4	**(a)**	Explain the different types of data models with proper example	**05**
	(b)	What do you mean by attributes in a table? Explain all the different types of attributes in brief	**05**
	(c)	Suppose that we have a relation marks (ID, score) and we wish to assign grades to students based on the score as follows: grade F if score< 40, grade C if 40 <=score< 60, grade B if 60<= score<80, and grade A if 80<= score. Write SQL queries to do the following: a. Display the grade for each student, based on the marks relation. b. Find the number of students with each grade **OR** What is JOIN clause in SQL? Explain in detail with proper example	**07**
Q.5	**(a)**	What are the views in SQL queries. Explain with example **OR** What are the different operators available in SQL? Explain them in brief	**05**
	(b)	What is DDL? Explain all the DDL statements to create and manage tables in brief	**05**
	(c)	Define Normalization in context to DBMS. Compare all the different types of norms with example	**07**
Q.6	**(a)**	Design a database for an airline. The database must keep track of customers and their reservations, flights and their status, seat assignments on individual flights, and the schedule and routing of future flights **OR** Design a database for a worldwide package delivery company (e.g., DHL or FedEx). The database must be able to keep track of customers who ship items and customers who receive items; some customers may do both. Each package must be identifiable and trackable, so the database must be able to store the location of the package and its history of locations. Locations include trucks, planes, airports, and warehouses	**08**
	(b)	What is the importance of key in DBMS? Explain all the keys with proper example	**08**

END OF PAPER

NATIONAL FORENSIC SCIENCES UNIVERSITY

B.Tech. – M.Tech. (Cyber Security) III Sem - Jan-2023

Practical Examination

Subject Code: CTBTCSE SIII L2 **Date: 19/01/2023**

Subject Name: DBMS

Time: 2:00 PM- 5:00 PM **Total Marks: 100**

Instructions:

1. **Write down each question on separate page.**
2. **Attempt all questions.**
3. **Implement the question' answers in MySQL. Develop tables, give appropriate values & establish relations.**

		Marks
Q1	Flights(flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: real) Aircraft(aid: integer, aname: string, cruisingrange: integer) Certified(eid: integer, aid: integer) Employees(eid: integer, ename: string, salary: integer) Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly. Write each of the following queries in SQL. 1. Find the names of aircraft such that all pilots certified to operate them have salaries more than $80,000. 2. For each pilot who is certified for more than three aircraft, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified. 3. Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu. 4. For all aircraft with cruisingrange over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft. 5. Find the names of pilots certified for some Boeing aircraft.	50
Q.2	Consider the following relations Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(name: string, meets at: string, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty(fid: integer, fname: string, deptid: integer) 1. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five. 2. For each level, print the level and the average age of students for that level. 3. For all levels except JR, print the level and the average age of students for that level. 4. For each faculty member that has taught classes only in room R128, print the faculty member's name and the total number of classes she or he has taught. 5. Find the names of students enrolled in the maximum number of classes	50