Class Test (1) Examination: Fall-2024
Course Code: CIS 222 (Batch: 17)
Course Title: Database Management System (DBMS)
Date: 11/09/2024

Time: 30 Minutes **Total Marks: 15**

1. As a student of CIS, why do you read Database Management System (DBMS)? Give a proper explanation. [4]

2 Explain about integrity constraints over relations? [3]

3. "The main goal of a database management system (DBMS) is to provide an efficient and effective way to store, retrieve, and manipulate data". Explain the statement. [3]

4 Define the following terms: [5]

a) Data redundancy
b) Data Consistency
c) Data Integrity
d) Data Isolation
e) Instance & schema

Class Test (2) Examination: Fall-2024
Course Code: CIS 222 (Batch: 17)
Course Title: Database Management System (DBMS)
Date: 30/10/2024

Time: 30 Minutes **Total Marks: 15**

There will entry (Unique ID) of all the employee of any Organization. According to the date of joining and date up to which salary is created, Number of days will be entered. Basic pay will be defined according to the post of employee and department. Then component like DA, HRA, medical allowance, Arrears will be added, and Charges of Hostel/ Bus, Security, welfare fund and other will be deducted. The number of leaves taken by the employee. [7]

Draw an ER diagram that represents this information. Make sure to capture the constraints on the relationships involved, and designate appropriate primary keys for the entities.

. List at least six attribute names for the DIU Library Management System, and identify possible super keys and alternate keys. [4]

. Define the following terms: Primary Key, Foreign key, NOT NULL constraints and Referential integrity (Foreign Key) constraint. [4]

Class Test (3) Examination: Fall-2024
Course Code: CIS 222 (Batch: 17)
Course Title: Database Management System (DBMS)
Date: 27/11/2024

Time: 35 Minutes **Total Marks: 15**

Stu_ID	Stu_Name	Course	Instructor	Instructor-Phone
231-16-011	SUMAYA	DBMS	MH	1234567890
231-16-011	SUMAYA	COF	SHM	9876543210
231-16-012	SMARON	CN	MH	
231-16-013	MOLY	DBMS	MH	1234567890
231-16-014	Baizid	COF	SHM	9876543210

1. Write a SQL query that change the attribute name from 'Stu_ID' to 'Student_ID'. **[2]**

2. Will any anomalies occur in the above table? Explain with proper examples. **[3]**

3. Show the result of each step of the normalizing process. [upto 3 NF] **[6]**

4. Prepare the data dictionary from the normalized table, ensuring proper integrity constraints are used. **[4]**

Daffodil International University

Faculty of Science & Information Technology

Department of Computing and Information System

Final Examination, Fall-2024

Course Code: CIS222, Course Title: Database Management System

Level: 2 Term: 2

Exam Duration: 2 Hours **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	(a)	As a student of CIS, why do you read Database Management System (DBMS)? Give a proper explanation.	[3]	CO1 L-1,2
	(b)	Why are Keys required in DBMS? Identify the possible *super keys*, *candidate keys*, *primary key*, and *alternate keys* for the following schema: Employee (ID, Name, SSN, Salary, Phone, Email)	[5]	
	(c)	Briefly describe about *Instances* and *Schema.*	[2]	

2.	(a)	In the Fall 2024 semester, the course coordinator of the CIS department is offering a variety of courses for students. From the course list, the following students have selected the courses mentioned, as detailed in Table 01.	[6]	CO3 L-1,2,4

Stu_ID	Stu_Name	Course_Name	Instructor_Name	Phone_Numbers
231-16-030	Delower	DS	MH	0134567890, 0145678901
231-16-033	Mohaiminul	DBMS	KF	0176789012
231-16-034	VAGGO	DS	MH	0168901234, -0139012345
231-16-035	PIASH	DBMS, AI	KF, DMR	0170123456
231-16-036	Mahmudur	AI, DS	DMR, MH	0131234567
231-16-037	RAFIUR	DS	MH	0169876540, 0191234560

Table 01: Course_Registration

Show the result of each step of the normalizing process. [upto 3 NF]

	(b)	List out the states of a transaction. Explain the ACID properties.	[4]	

3.	(a)	In the Fall 2024 semester, 92 students were admitted to the CIS department. The admissions office recorded the required information for all the students. The information for the first six students is displayed in the following table:	[4]	CO3 L-3,5

ID	Name	SSC	HSC	District	Age
221-16-599	Rimon	5.00	4.80	Rajshahi	24
221-16-600	Ronit	5.00	5.00	Dhaka	26
221-16-601	TASHIN	4.75	4.90	Bogra	21
221-16-602	Ratul	4.50	5.00	Chattogram	23
221-16-604	Shihab	5.00	4.50	Comilla	24
221-16-605	SHUVO	4.90	4.30	Dhaka	20

Table 02: Student_Information

Write the SQL DDL based on the above mentioned table. [Ensure appropriate integrity constraints for all attributes]

	(b)	Write the Relational Algebra (RA) expressions and SQL queries for the following tasks based on Table 02: 1. Find the name of the student who has the second-highest age. 2. Retrieve the Student ID and Name for students whose district is either Rajshahi or Dhaka. 3. Retrieve all records where the fourth character of the students' names is 'H'.	[6]	

4.	(a)	Why is SQL join needed? Discuss about various joins with proper examples.	[6]	CO2
	(b)	A university wants to set up a database to record details about its staff, and the departments they belong to. They intend to record the following information. • For each member of staff, their staff identity number, name, job title, and salary. • For each department, its name and address. • For each member of staff, all departments that they belong to. It is required that every member of staff belongs to at least one department. • For each department, the head of department. It is required that each department has exactly one head of department. **Draw an ER diagram that represents this information. Make sure to capture the constraints on the relationships involved, and designate appropriate primary keys for the entities.**	[4]	L-2,3,4

Lab Final Examination: Fall-2024

Course Code: CIS 222L (Batch: 17_A)

Course Title: Database Management System Lab

Date: 12/12/2024

Time: 1 Hour **Total Marks: 40**

Consider a **Hotel Reservation System** where guests book rooms, and each booking stores details of the guest, room type, and the staff member assigned to the reservation.

Booking ID	Guest ID	Guest Name	Room ID	Room Type	Staff ID	Staff Name	Check-In-Date	Check-Out-Date
1	101	Tamim	R001	Deluxe	S01	Milon	10/1/2024	10/5/2024
2	102	Sisir	R002	Standard	S02	Raju	10/2/2024	10/4/2024
3	101	Tamim	R002	Standard	S02	Raju	10/6/2024	10/8/2024
4	103	Badsha	R003	Suite	S03	Tofael	10/7/2024	10/9/2024

Final Structure After Normalization (Up to 3NF)

Table: Bookings

Booking ID	Guest ID	Room ID	Staff ID	Check-In-Date	Check-Out-Date
1	101	R001	S01	10/1/2024	10/5/2024
2	102	R002	S02	10/2/2024	10/4/2024
3	101	R002	S02	10/6/2024	10/8/2024
4	103	R003	S03	10/7/2024	10/9/2024

Table: Guests

Guest ID	Guest Name
101	Tamim
102	Sisir
103	Badsha

Table: Rooms

Room ID	Room Type
R001	Deluxe
R002	Standard
R003	Suite

Table: Staff

Staff ID	Staff Name
S01	Milon
S02	Raju
S03	Tofael

Task 1 – Basic Structure (16 Marks)

Q1. Create the table and insert data as per the normalized table mentioned above under the "**Hotel Reservation System**" database.

Task 2 –SQL Query (6×4=24 Marks)

Q2. Find guests with names starting with 'T'

Q3. Find staff not named 'Raju'

Q4. Find bookings with Check-In Dates from 10/1/2024 to 10/5/2024

Q5. Count total bookings per room

Q6. Find guests who have made multiple bookings

Q7. Find the latest Check-Out Date for each room