ourdiu.com | Shared by FARIHA JAHAN ANISHA

Daffodil International University

Faculty of Science & Information Technology

Department of Computing and Information System

Final Examination, Summer 2025

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)	List three significant differences between a file-processing system and a DBMS.	[3]	CO1 L-1,2
	(b)	What is a candidate key in a relational database, and how does it differ from a primary key? Give an example.	[3]	
	(c)	Consider the following relation schema. If each student can enroll in multiple courses and each course can have multiple students, which key(s) would you define as the primary key? *Relation Schema*: **StudentCourses(StudentID, CourseID)**	[2]	

2.	(a)	**Unnormalized Table (Student Management Systems)** (table below) ***Display the result of each step in the normalization process (up to 3NF), and provide the data dictionary for each resulting table.***	[8]	CO3 L-1,2,4
	(b)	Differentiate between Natural Join and Inner Join in SQL with proper examples. Highlight how they handle join conditions, output, and control over attributes.	[4]	

Enroll_ID	Student_ID	Student_Name	Dept	Course_Code	Course_Title	Instructor_Name	Instructor_Contact
301	S01	Arif	CSE	CSE101	Database Systems	Dr. Karim	1811111111
302	S02	Nabila	CSE	CSE101	Database Systems	Dr. Karim	1811111111
303	S01	Arif	CSE	CSE202	Data Structures	Dr. Rahman	1822222222
304	S03	Tanvir	EEE	EEE105	Circuit Analysis	Dr. Alam	1833333333
305	S02	Nabila	CSE	CSE202	Data Structures	Dr. Rahman	1822222222
306	S04	Meghla	BBA	BBA110	Principles of Management	Dr. Hasan	1844444444

ourdiu.com | Shared by FARIHA JAHAN ANISHA

3.	(a)	In Summer 2025, 50 new patients registered at a community clinic. The clinic kept basic records; the first six are shown below.	[4]	CO3 L-3,5

P_ID	P_Name	Gender	Age	District	Phone
25-001	ARMAN	M	20	Dhaka	01709890986
25-002	NADIA	F	19	Chittagong	01824543257
25-003	SUMON	M	21	Sylhet	01609856789
25-004	RIMA	F	27	Rajshahi	01767556498
25-005	TAREQ	M	22	Khulna	01876509873
25-006	MUNNA	F	18	Dhaka	01387653980

Table 02: Patient_Information

Write the SQL DDL & DML for three Patient records, enforcing appropriate integrity constraints for all attributes.

	(b)	Write the SQL queries for the following tasks based on ***Table 02***. I. Find the patient(s) with the highest age. II. Increase Age by 3 for patients under 20. III. Find the patient(s) phone number who uses the "*Robi Sim Operator*". IV. Find patients whose age is between 19 and 23.	[8]	
4.	(a)	Explain what a derived attribute is in a database, and illustrate your answer with a real-world example.	[3]	CO2 L-2,3,4
	(b)	*An online bookstore wants to create a database to manage its inventory, customer information, and sales. This system will track books, customers, and orders. The business has identified the following requirements:* • *Customers can place orders, and a customer can place many orders.* • *An order can contain one or more products (books).* • *A book can have one or more authors, and an author can write multiple books.* ***Now, visualize an ER diagram that will be designed by you. Make sure to capture the constraints on the relationships involved, and designate appropriate primary keys for the entities.***	[5]	