



**Bachelor of Information Technology (BIT) Programme
End Semester Examination (Semester 02)**

Module Name : Fundamentals of Database Management

Module Code : BIT1201

Assessor : Ms. Chathurangi Dhanushika Weerasinghe

Batch : BIT 003

Date : 29th August 2022

Time : 1.00 PM – 4.00 PM

Special Instructions to the candidates:

1. The Assessment is conducted online as Alternative Assessment according to Non-State Higher Education guidelines.
2. Answer 04 questions only.
3. Illustrate your answers with clear diagrams wherever applied.
4. The paper is marked out of 100 Marks.
5. Must be submitted on or before the deadline stated.
6. Follow the General Guidelines given by the Department of Examination.

Question 01

'Health is Wealth' is a leading chain of pharmacies which supplies quality medicines for your prescriptions. The following requirements are given to model a pharmaceutical application for them.

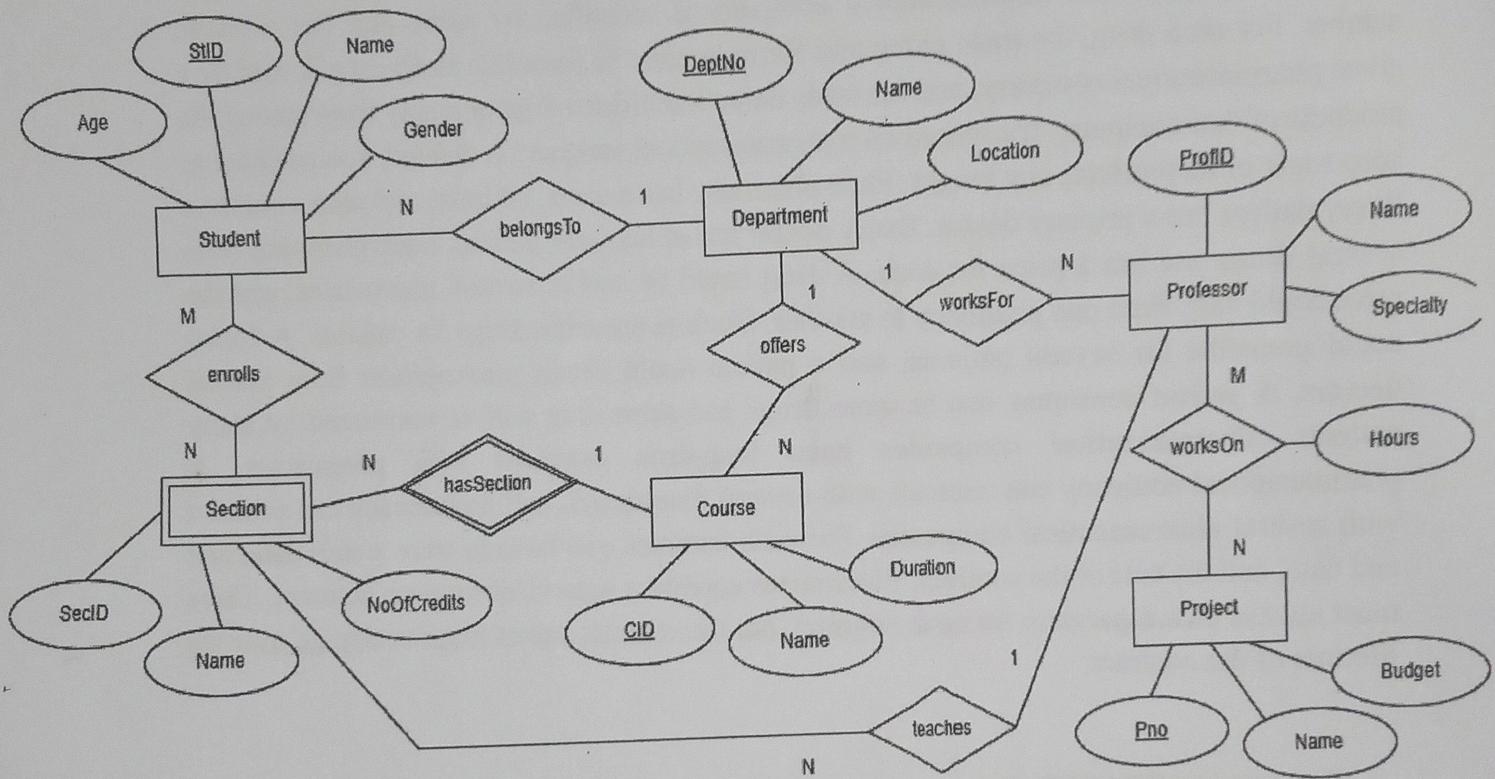
Patients are identified by an SSN, and their names, addresses, and ages must be recorded. Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded. Each pharmaceutical company is identified by name and has a phone number. For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a record on a pharmaceutical company is deleted, you need not to keep track of its products any longer. Each pharmacy has a name, address, and phone number. Every patient has a primary doctor. Every doctor has at least one patient. Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another. Doctors prescribe drugs for patients. A doctor could prescribe for several patients, and a patient could obtain prescriptions from several doctors. A patient consumes one or more drugs and same drug will be consumed by many patients. Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, and end date, and the text of the contract. Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.

- a) Draw the **ER/ EER diagram** to model the above situation. Your diagram should show entities, relationships along with the cardinalities and suitable attributes including the primary keys, and other constraints. [15 marks]
- b) Consider the ER diagram drawn for question a) and map the **Drug entity** to relational schema (consider primary key, foreign key, attribute types). [5 marks]
- c) What is the degree of the **Drug table**? [5 marks]

[Total = 25 marks]

Question 02

Map the ER diagram given below to a relation schema. Clearly mention if you are doing any assumptions when mapping the diagram.



[Total = 25 marks]

Question 03

The table below shows the project information of 'ABC Marketing Ltd'.

Emp_Proj

Emp_ID	Project_No	Project_Name	Start_Date	Emp_Position	Name	Hours	RateUSD
E001	P1	Millers	01/05/2022	Coordinator	Chathurangi	15	450
E002	P2	Cobler	12/05/2022	Advertiser	Duleesha	20	400
E001	P2	Cobler	15/05/2022	Advertiser	Ravishma	20	400
E003	P3	Wedlores	28/05/2022	Team Lead	Chamini	12	550

Emp_Proj table Primary Key: - (Emp ID, Project No)

Answer the following question using the table and dependencies given below on the Emp_Proj table.

$\text{Emp_ID} \rightarrow \text{Name}$

$\text{Project_No} \rightarrow \text{Project_Name, Start_Date}$

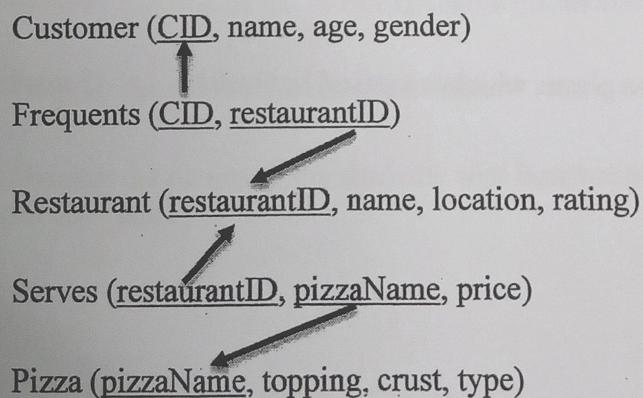
$\text{Emp_Position} \rightarrow \text{Rate}$

- a) Which normal form is the relation in? Explain your answer. [10 marks]
- b) Decompose the relation into 3NF. For each step of the decomposition procedure, state what functional dependency it is based on, and give the relation schemas are the step has been carried out. [15 marks]

[Total = 25 marks]

Question 04

'Yummy Pizza' is a pizza delivery service which keeps track of pizza restaurants and the customers. Consider the following relational schema of the pizza restaurants.



Customer			
CID	name	age	gender
C01	Tom	18	M
C02	Rukie	25	F
C03	William	35	M
....

Restaurant			
restaurantID	name	location	rating
Res01	Hippo	Bentley	A
Res02	Tantan	Belmount	B
....

Prefers	
CID	restaurantID
C01	Res01
C02	Res02
C03	Res01
....

Serves		
restaurantID	PizzaName	price
Res01	Deviled chicken	2150
Res02	BBQ chicken	1200
Res01	Vege supreme	850
Res02	Deviled chicken	900
....

Pizza			
PizzaName	Topping	Crust	type
Deviled chicken	Cheese	Thin	Classic
BBQ chicken	mushroom	Italiano	Supremo
Vege supreme	Cheese	Dipper	Signature
....

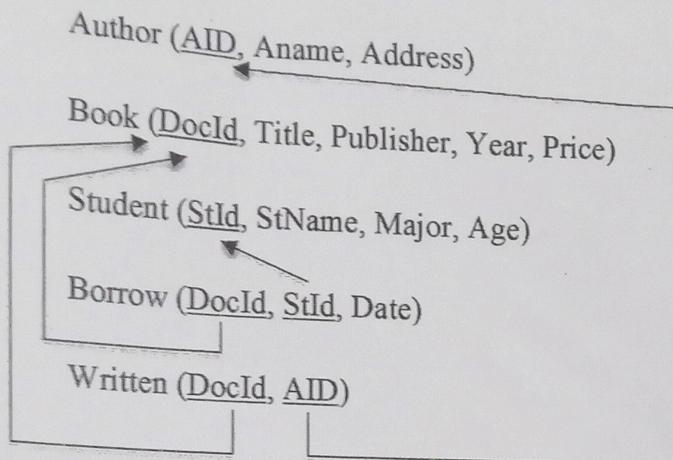
Write SQL statements to answer the following questions.

- a) Find the names of 'A' rate restaurants which serve either mushroom or cheese topping pizzas. [5 marks]
- b) Display the name of the restaurant which serves the cheapest pizza. [5 marks]
- c) Display the names of the customer who prefers more than one restaurant. [5 marks]
- d) Retrieve all details of male customers. [5 marks]
- e) Display all information about the pizzas which are served by Res01. [5 marks]

[Total = 25 marks]

Question 05

Consider the following relational schema of a library database. (Primary keys are underlined)



Write SQL statements to answer the following questions.

- List the title and author names of the books published by the publisher 'McGraw-Hill' before 2012. [5 marks]
- Write a SQL statement to enter the following student detail into the student table.

Student ID: 100035350
Name: Dhanu Weerasinghe
Major: Computing
Age: not given

[5 marks]

- Display the title of the most expensive book. [5 marks]
- Display the title of the cheapest book. [5 marks]
- Display the names of the students who borrowed more than 2 books from the library. [5 marks]

[5 marks]

[Total = 25 marks]

***** End of the paper. *****