



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY

DEPARTMENT OF DIGITAL TECHNOLOGY

QUESTION PAPER

COURSE CODE : CDT 201
COURSE TITLE : Database Design and Implementation
DURATION : 3 Hours
LEVEL : 2.1
DATE : August 2021

11 B Am

INSTRUCTIONS TO EXAMINERS:

1. ANSWER ALL QUESTIONS
2. YOU MAY USE SQL SERVER OR MYSQL SYNTAX

Question 1

- a) What do you understand by Data Redundancy? [4]
- b) What do you understand by Data Independence? [2]
- c) Define Entity, Entity type, and Entity set. [6]
- d) Define Phantom deadlock. [2]
- e) Explain the Primary Key and Composite Key. [4]
- f) Why is Database Design important? [3]

Question 2

- a) Car Dealership-Create an ERD for a car dealership. The dealership sells both new and used cars, and it operates a service facility (see Figure B.2). Base your design on the following business rules:

- A salesperson may sell many cars, but each car is sold by only one salesperson.
 - A customer may buy many cars, but each car is bought by only one customer.
 - A salesperson writes a single invoice for each car he or she sells.
 - A customer gets an invoice for each car he or she buys.
 - A customer may come in just to have his or her car serviced; that is, a customer need not buy a car to be classified as a customer.
 - When a customer takes one or more cars in for repair or service, one service ticket is written for each car.
 - The car dealership maintains a service history for each of the cars serviced. The service records are referenced by the car's serial number.
 - A car brought in for service can be worked on by many mechanics, and each mechanic may work on many cars.
 - A car that is serviced may or may not need parts (e.g., adjusting a carburetor or cleaning a fuel injector nozzle does not require providing new parts).
- [15]

- b) In order to save costs, an Internet Service Provider (ISP) hosts both the website and the database of a company on the same web server. Discuss the disadvantage of this decision from a security point of view. [4]
- c) Describe two examples in which triggers can be used to secure data in a database. [6]

Question 3

- a) The ZEGU Fashion Society hosts various fashion shows where they showcase some of the work done by the University's fashion design students. The society outsource modelling services from model agencies who each have a fixed agency rate for each of their models. As things currently stand, the society reports on their events by making use of a spreadsheet that tracks the event, the models hired and the cost of each model. An extract of this spreadsheet is illustrated in Table 5 below. The ZEGU Fashion Society

would like you to assist them develop a database system that will help them keep track of the cost of their events in a much more structured manner.

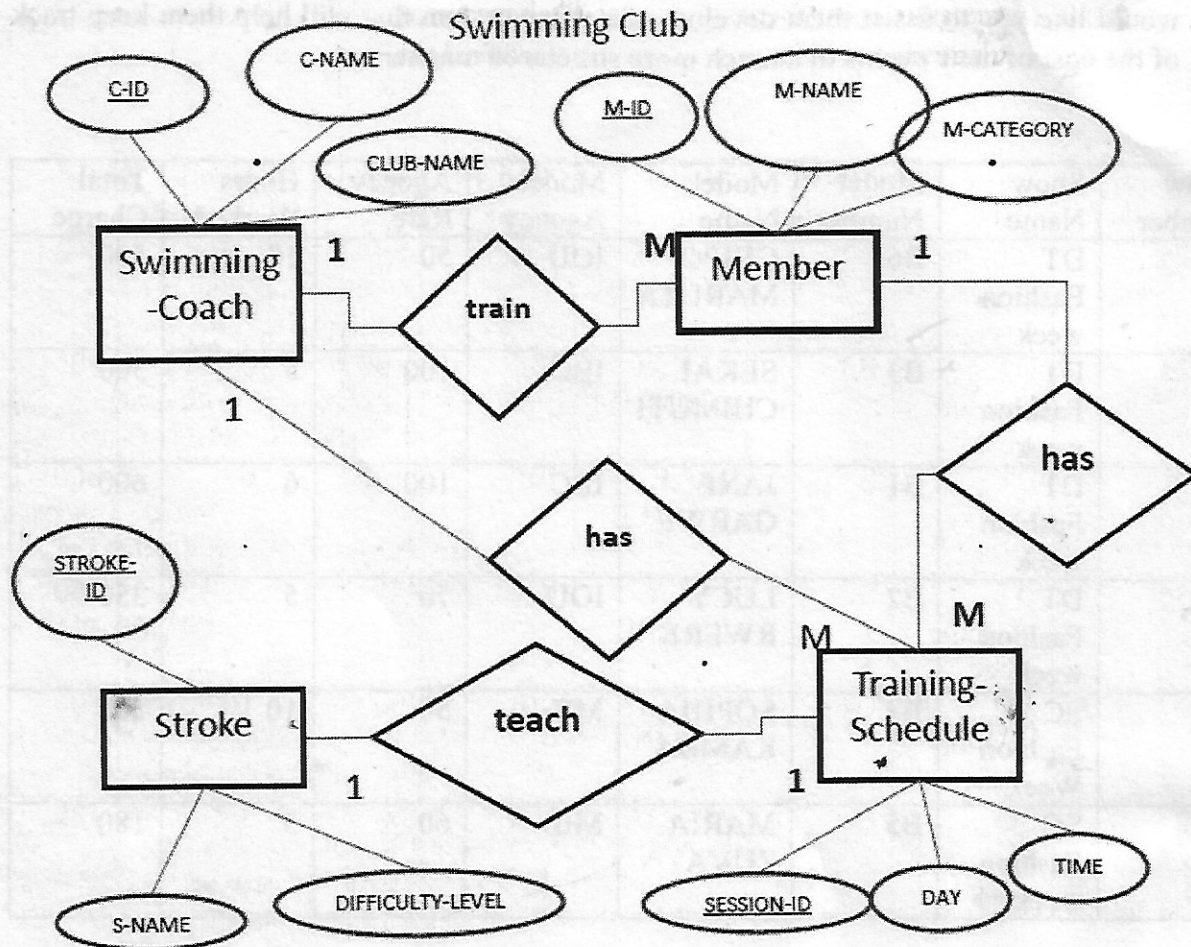
Show number	Show Name	Model Number	Model Name	Model Agency	Agency Rate	Hours Worked	Total Charge
25	DT Fashion week	B6	CHIPO MARUTA	IOU	50	10	500
25	DT Fashion week	B3	SEKAI CHIMUTI	IBC	100	5	500
26	DT Fashion week	B1	JANE GARWE	IBC	100	6	600
26	DT Fashion week	B2	LUCY RWERE	IOU	70	5	350
27	SC Fashion Week	B4	SOPHIA KAMBA	MIL	50	10	500
27	SC Fashion week	B5	MARIA ZUVA	MIL	60	3	180

Use dependency diagrams to depict how the spreadsheet illustrated in Table 5 would look in Third Normal Form (3NF). [8]

- b) Convert the normalized tables to SQL equivalent [8]
- c) Insert data into the normalized tables. [2]
- d) Increase agent rate by 50% [2]
- e) Delete model agent Mil [2]
- f) Write a query that joins the normalized table to its original to the unnormalised table [3]

Question 4

Map the following Entity Relationship Diagram to appropriate relations, and construct the structure of the tables.



[5]

b) Convert the mapped tables into SQL

[5]

c) The HR department wants you to create SQL statements to insert, update, and delete employee data.

i) As a prototype, you use the MY_EMPLOYEE table, before giving the statements to the HR department. [3]

ii) Insert 2 records into the MY_EMPLOYEE table. [2]

iii) Identify the structure of the MY_EMPLOYEE table to identify the column names. [1]

iv) Change the last name of employee 2 to Mike. [2]

d) A new university called High Hills has been established and they have hired you to design a database for them. Outline all the steps that you would take in designing a database for them from scratch. [7]

.....End of Paper:....