



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 : 2021

INSTRUCTIONS TO EXAMINERS:

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

Question 1

- a) What are the responsibilities of a DBA? [3]
- b) If we assume that the DBA is never interested in running his or her own queries, does the DBA still need to understand query optimization? Why? [3]
- c) Define a constraint and give four examples of constraint? [5]
- d) What is an ALIAS command and give example? [4]
- e) Using your own suitable examples and diagrams, explain in your own words what the following database concepts mean: [5]
- a. Database Transaction
 - b. ACID Properties
 - c. Isolation Level
- f) A company employee has been using the password "APPLE" for the past six months to access a database. Discuss why this poses a security risk and suggest ways in which the company could improve password management. [5]

Question 2

- a) **Manufacturer**-A manufacturing company produces products. The following product information is stored: product name, product ID and quantity on hand. These products are made up of many components. Each component can be supplied by one or more suppliers. The following component information is kept: component ID, name, description, suppliers who supply them, and products in which they are used. Create an ERD to show how you would track this information. Show entity names, primary keys, attributes for each entity, relationships between the entities and cardinality.

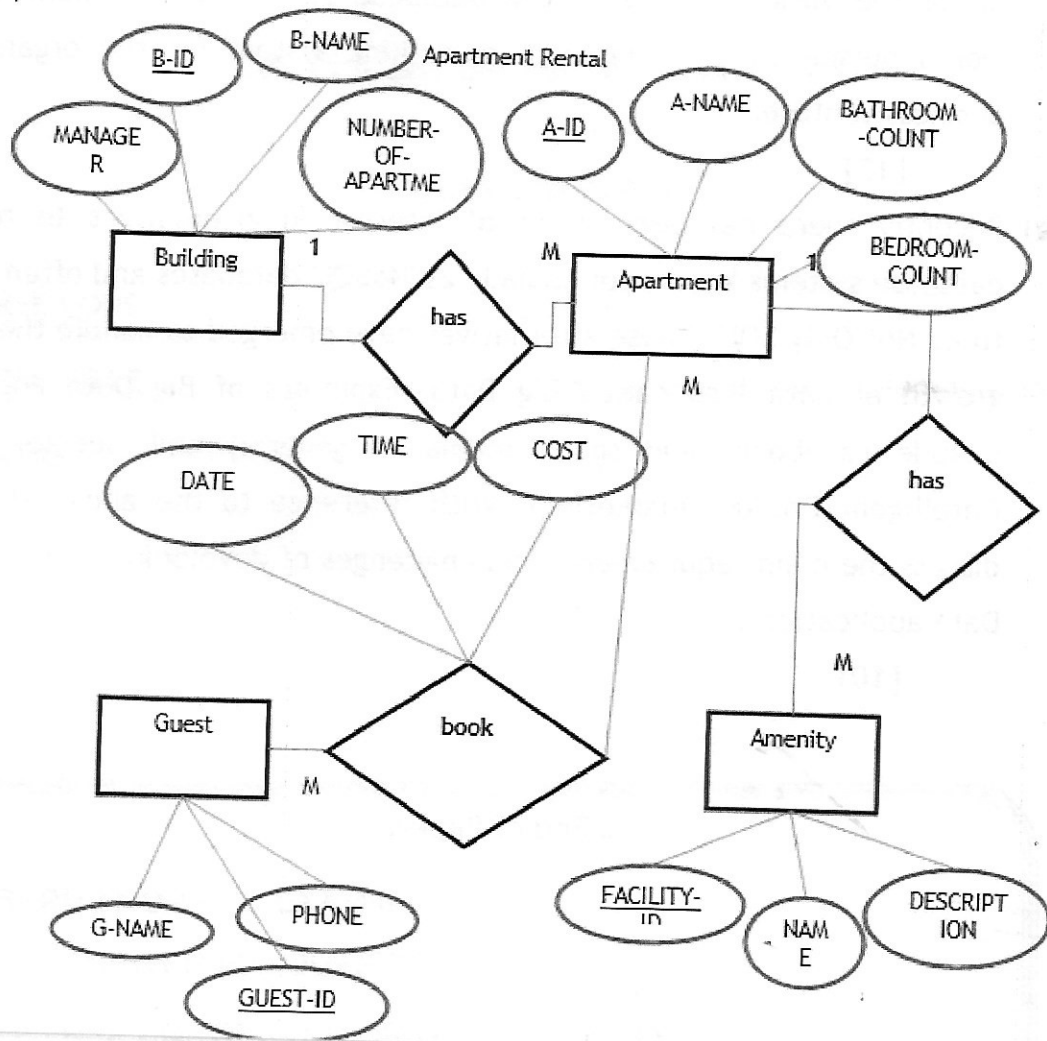
Assumptions

- A supplier can exist without providing components.
 - A component does not have to be associated with a supplier.
 - A component does not have to be associated with a product. Not all components are used in products.
 - A product cannot exist without components. [15]
- b) Describe an appropriate database security control for each of the following security threats:
- i) Ransomware.
 - ii) SQL injection.
 - iii) An employee leaving the company.
 - iv) Brute-force password attacks.
 - v) An employee making mistakes while entering data. [10]

Question 3

- a) Map the following Entity Relationship Diagram to appropriate relations, and construct the structure of the tables. Indicate primary, secondary and candidate keys

[5]



- b) create tables from a, above using SQL scripts. The Guest table should start from 1001 and increment by 1

[10]

- c) modify table apartment to include constraint for A-name to include only names nyadzonya, manhede, chemoto, chipadze, chemuzhanje

[2]

- d) modify Guest apartment table to a date today and cost to be above 1000 bond [2]
- e) modify guest to have a phone number of range 078-62608-97 [2]
- f) Describe two examples in which triggers can be used to secure data in a database. [4]

Question 4

- a) ZB Financial Holdings has recently acquired a licence to venture into the banking sector. As the database designer for the organisation, explain in detail the various stages of the database system development that you would pursue to come up with a banking system for the organisation's business venture.

[15]

- b) Recently there has been a lot of interest in alternatives to relational database systems known colloquially as 'NoSQL' databases and often referred to as 'Not Only SQL'. These alternatives have emerged to handle the massive growth of data - so called Big Data. Examples of Big Data applications include Facebook (and social media in general) and Google Analytics (Intelligent Product marketing). With reference to the above statement, discuss the main requirements and challenges of developing and running Big Data applications.

[10]

...End of Paper.....