

ZIMBABWE EZEKIEL GUTI UNIVERSITY



FACULTY OF HEALTH, SCIENCE AND TECHNOLOGY

Department of Digital Technology

Module: CDT 107 Database Systems

Exam Duration: 3 hours

End of Semester Examination for 29 May 2019

Instructions

- (i) Answer all questions, the mark allocation for each question is shown in square brackets.
- (ii) Number your answers accordingly.
- (iii) The total marks for the examination is 100.

Question 1

Name the stages in database design stage and briefly describe each. [10]

Question 2

Discuss the following terms as used in DBMS transaction:

- a. No waiting protocol. [3]
- b. Cautious waiting protocol. [3]
- c. Time out. [2]
- d. Victim selection. [2]

Question 3

Discuss each of the following concepts in the context of the relational data model:

- a. Relationship. [2]
- b. Entity. [2]
- c. Attribute. [2]
- d. Domain. [2]
- e. Entity type. [2]

Question 4

- a. What is an ER diagram? [2]
- b. Suppose you are given the following requirements for a simple database for the Northern Zone Hockey League(NZHL):
 - The NZHL has many teams,
 - Each team has a name, a city, a coach, a captain, and a set of players,
 - Each player belongs to only one team,
 - Each player has a name, a position, a skill level, and a set of injury records,
 - A team captain is also a player,
 - A game is played between two teams (referred to as host_team and guest_team) and has a date and a score (such as 2 to1).

Construct an ER diagram for the NZHL database. [8]

Question 5

- a. Discuss the acid properties of a database. [10]

Question 6

- a. i. What is concurrency control? [3]
- ii. Describe three problems that can arise if concurrency control fails. [8]
- b. i. Explain the Validation-Based (Optimistic) Concurrency Control. [3]
- ii. Explain the three phases for the Validation-Based Control protocol. [8]

Question 7

- a. Explain deadlock. [4]
- b. Describe 2 ways in which the deadlock can be prevented. [4]
- c. Use two transactions T1 and T2 to demonstrate deadlock. [4]

Question 8

Define the following terms as used in the database life cycle:

- i. System definition. [2]
- ii. Database application. [2]
- iii. User view. [2]

Question 9

Describe any five Database Management Systems. [10]