ICT3621

October/November 2016

DATABASE DESIGN

Duration   2 Hours

100 Marks

EXAMINERS
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SECOND   MRS EN MWIM
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Closed book examination

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This paper consists of 3 pages.

Instructions:
1   Answer all the questions
2   The mark for each question is given in brackets next to the question
3   All the answers and all the rough work must be done in your answer book
4   Number your answers and label your rough work clearly

ALL THE BEST!

Question 1

[17]

KwaZulu-Natal Basketball Region (KZNBR) is part of the South African Basketball Association It has a league competition Every city in KwaZulu-Natal has one team that represents them in the league Each team needs to register a minimum of 12 players and the maximum 15 players Each team needs to register two coaches (head coach and assistant coach) During the season, each team plays two games against each other team One game is played away and the other game is played at home

KZNBR needs to record the details of the games For each game, they need to record the score, number of fouls, number of time-outs and number of free throws made Additionally, they need to keep track of all the players and their scoring history The names and contact details of the coaches are required Each city has a different court location which needs to be stored in the database

Given all of the above conditions, do the following

- Draw the ERDs to represent the KZNBR database

- Indicate all the entities and their dependencies

- Indicate all the relationships among the entities

Question 2

[14]

ABC is a non-profit organisation It has information which is stored on several databases and different information is replicated Some of the information is not updated on some of the databases The information on the databases is conflicting These databases are stored at different locations According to the database administrator, this causes data redundancies Discuss data redundancy and includes all the stages that uncontrolled data redundancy can have

Question 3 [25]

The diagram below represents the ERD of a university system This ERD shows different entities, attributes and relationships It was designed taking the business rules of the university into consideration Use the diagram below to answer the questions that follow
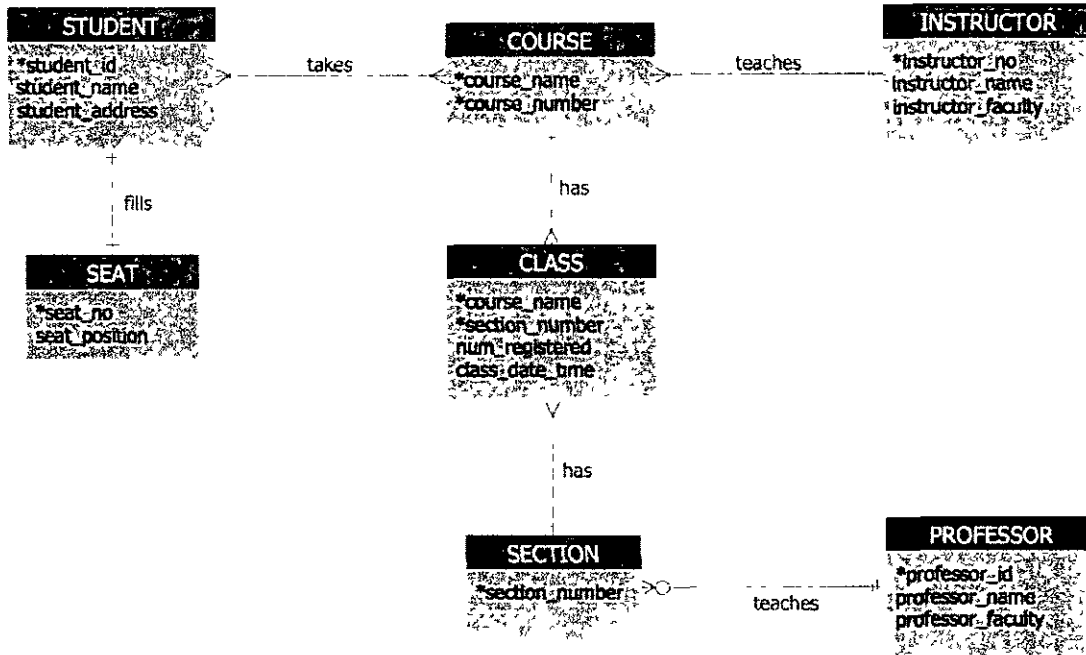
4 1 Explain the following terms and identify an example from the above diagram

4 1.1 Entity

4 1 2 Attribute

4 2 3 Relationship

4 2 4 Constraint

4 2 Discuss three different types of relationships and provide an example

4 3 Identify three business rules and identify the relationship for each from the above diagram

4 4 Provide five reasons for identifying and documenting business rules essential in the database design

Question 4   **[20]**

The dependency diagram below indicates information about different projects Dependency diagrams help to get a bird's-eye view of all relationships among a table's attributes and their use makes it less likely that you will overlook an important dependency.
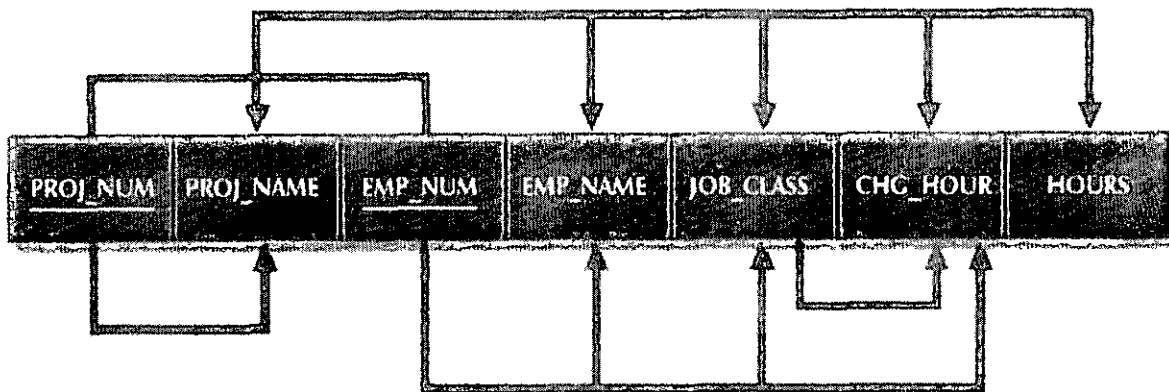
5 1 Based on the above dependency diagram, create a database whose tables are in the 2NF, showing the dependency diagram for each table

5 2 When is the table 3NF?

5 3 What is partial dependency? With what normal form is it associated? Provide an example from the diagram

5.4 What three data anomalies are likely to be the result of data redundancy? How can these anomalies be eliminated?

Question 5   **[24]**
The Database Life Cycle (DBLC) contains six different phases. All these phases have different objectives Describe the different phases and the objectives of each phase