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**Semester I 2024/2025**

Subject : Database (SECD2523)

Section : 09 – Dr Haslina Hashim

Task : LAB 2-1 - Relational Model 1 (Keys)

## Instruction:

Students are required to discuss the questions below.

**QUESTION 02**

Identify **superkey, candidate key, primary key** and **foreign** key (if any) for relations below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | a) HOTEL (hotelNo, hotelName, city)   |  |  | | --- | --- | | Superkey:  hotelNo , HotelName , city | Candidate keys:  HotelName | | Primary key:  HotelNo | Foreign keys:  None | |
|  | b) ROOM (roomNo, hotelNo, type, price)   |  |  | | --- | --- | | Superkey:  roomNo, hotelNo, type, price | Candidate keys:  roomNo , HotelNo | | Primary key:  roomNo | Foreign keys:  hotelNo | |
|  | c) BOOKING (hotelNo, guestNo, dateFrom, dateTo, roomNo)   |  |  | | --- | --- | | Superkey:  hotelNo, guestNo, dateFrom, dateTo, roomNo | Candidate keys:  hotelNo, guestNo, dateFrom, dateTo, roomNo | | Primary key:  hotelNo, guestNo, dateFrom, dateTo, roomNo | Foreign keys:  HotelNo , roomNo, | |
|  | d) GUEST(guestNo, guestName, guestAddress)   |  |  | | --- | --- | | Superkey:  guestNo, guestName, guestAddress | Candidate keys:  guestNo | | Primary key:  guestNo | Foreign keys: | |
|  | e) Explain how the entity and referential integrity rules apply to these relations. |

## **QUESTION 03**

The following tables from part of a database held in a relational DBMS

|  |  |
| --- | --- |
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| a) | For each of relation schema, identify foreign key (if exist). |
| b) | Explain how the entity and referential integrity rules apply to **Booking** and **Court** relations. |

#### a) Foreign Key Identification

* **COURT:**
  + Foreign Key: None
* **BOOKING:**
  + Foreign Key: courtNo

#### b) Entity and Referential Integrity Rules

* **Entity Integrity:**
  + Each row in a table must have a unique identifier (primary key).
* **Referential Integrity:**
  + courtNo in BOOKING references the primary key in COURT. Any value in courtNo in BOOKING must exist in COURT.

## **QUESTION 04**

Refer to the tables below:







1. For each table, identify the primary key and the foreign key(s). If a table does not have a foreign key, write *None* in the space provided. Provide your answers in the following format.

|  |  |  |  |
| --- | --- | --- | --- |
| TABLE | CANDIDATE KEY(S) | PRIMARY KEY | FOREIGN KEY(S) |
| EMPLOYEE | empID | empID |  |
| STORE | storeID | storeID |  |
| REGION | regionID | regionID |  |

1. Do the tables exhibit entity integrity? Answer *yes* or *no*, and then explain your answer. Provide your answers in the following format.

|  |  |  |
| --- | --- | --- |
| TABLE | ENTITY INTEGRITY | EXPLANATION |
| EMPLOYEE | Yes | empID uniquely identifies each employee. |
| STORE | Yes | storeID uniquely identifies each store. |
| REGION | Yes | regionID uniquely identifies each region. |

## **QUESTION 05**

Consider a set of relations of student database as illustrate in the tables below:

STUDENT\_Table

|  |  |  |
| --- | --- | --- |
| **STUDENT\_ID** | **STUDENT\_NAME** | **ADVISOR\_ID** |
| 1035 | Syafiq | 49 |
| 3397 | Jenny | 49 |
| 4070 | Sharul | 23 |

ADVISOR\_Table

|  |  |  |
| --- | --- | --- |
| **ADVISOR\_ID** | **IC\_NO** | **ADVISOR\_NAME** |
| 23 | 670505084444 | Dr. Azizah |
| 49 | 690909043333 | Dr. Ali |

COURSE\_Table

|  |  |  |
| --- | --- | --- |
| **COURSE\_ID** | **COURSE\_NAME** | **COURSE\_CREDIT** |
| SCU 4044 | Project II | 4 |
| SCK 2443 | Systems Development | 3 |
| SCK 2423 | Database Systems | 3 |
| SCK 0123 | Intro IT | 3 |

GRADE\_Table

|  |  |  |
| --- | --- | --- |
| **STUDENT\_ID** | **COURSE\_ID** | **GRADE** |
| 1035 | SCU 4044 | A |
| 1035 | SCK 2423 | A |
| 3397 | SCK 0123 | A |
| 3397 | SCK 2443 | B |
| 4070 | SCK 2443 | A |

1. For **EACH** relation above, identify the Primary Key and the Foreign Key (if any).
2. There are **TWO** principal rules that apply to all instances of the above relations – entity integrity and referential integrity. By using the **STUDENT\_Table** and **ADVISOR\_Table** as cases, explain how both constraints pertain within these two relations.

#### Primary and Foreign Key Identification

|  |  |  |
| --- | --- | --- |
| **Relation** | **Primary Key** | **Foreign Key(s)** |
| STUDENT\_Table | STUDENT\_ID | ADVISOR\_ID |
| ADVISOR\_Table | ADVISOR\_ID | None |
| COURSE\_Table | COURSE\_ID | None |
| GRADE\_Table | (STUDENT\_ID, COURSE\_ID) | STUDENT\_ID, COURSE\_ID |

#### Entity and Referential Integrity Rules

* **Entity Integrity:**
  + Every primary key must be unique and not null. For example, STUDENT\_ID in STUDENT\_Table uniquely identifies each student.
* **Referential Integrity:**
  + Foreign keys must reference valid primary keys in parent tables. For instance, ADVISOR\_ID in STUDENT\_Table must match an existing ADVISOR\_ID in ADVISOR\_Table.