1. a) What is a relation?

b) Describe the difference between a relation instance (state) and a relation schema.

2. a) Describe Key, Composite Key, Candidate Key and Primary Key of a relation.

b) What is the difference between a candidate key and a super key?

3. Explain what is meant by a foreign key. How do foreign keys of relations relate to primary keys? How do you give the Foreign Key Constraint?

4. a) Discuss why it’s desirable to enforce Integrity Constraints.

b) List the available Integrity Constraints and describe each.

5. Refer the database schema and the sample data given.

Student

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| ID | Name | Date of Birth | Address | Course |

Course

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| ID | Name | Description |

**Student**

|  |  |  |  |  |
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| **ID** | **Name** | **Date of Birth** | **Address** | **Course** |
| IT11223311 | Sunil Perera | 9/8/1988 | Colombo | IT |
| IT11223322 | Asanka Soyza | 4/5/1988 | Galle | IT |
| IT11223333 | Nimalie De Silva | 3/8/1990 | Colombo | CSN |
| IT11223344 | Anjana Perera | 7/3/1989 | Kandy | IT |
| IT11223355 | Sarath Perera | 1/10/1988 | Matara | CSN |

**Course**

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| **ID** | **Name** | **Description** |
| IT | Information Technology | A course about important concepts related to Information Technology |
| CSN | Computer Systems and Networking | A course about important concepts related to Computer Science mainly focusing on Networking |

a) Identify possible DB operations in which the Referential Integrity Constraint can get violated.

b) Considering the sample data identify an example situation in which the constraint can get violated.

c) In case of a violation of the above constraint what are the actions you can specify for the DBMS to take.

d) How and where can you specify it.

6. Refer below schema and answer the following questions.

Employee (employee\_ID, Name, Address, NIC, Driving\_Licence\_No, Position,DateOfBirth)

a) Identify possible candidate key(s).

b) Identify a suitable primary key.

c) Are there any Composite Keys?

d) Identifying a Super Key.