

2 A relational database, WORKEXPERENCE, stores data about students and the companies where they complete work experience.

Students can complete multiple work experience placements but can only complete one placement at a time.

Students can complete more than one placement at the same company.

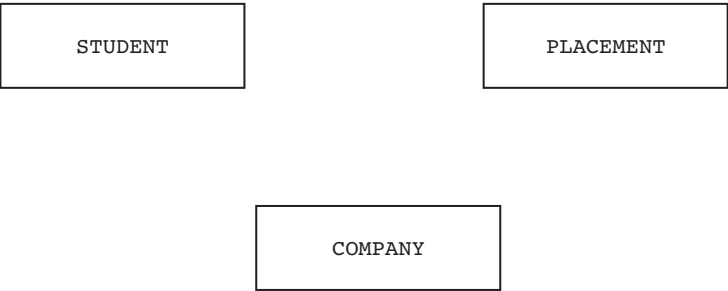
Part of the database is shown:

STUDENT(StudentID, FirstName, TelephoneNumber, UniversityName)

PLACEMENT(PlacementID, StudentID, CompanyID, StartDate, EndDate, Complete)

COMPANY(CompanyID, CompanyName, MaxStudentsPerPlacement)

(a) Complete the entity-relationship (E-R) diagram for the database WORKEXPERENCE.



[2]

(b) Explain why the database WORKEXPERENCE is in Third Normal Form (3NF).

[2]

(c) Some example data from the PLACEMENT table is shown:

PlacementID	StudentID	CompanyID	StartDate	EndDate	Complete
PC001	LDEA01	MSCM	01/01/2023	12/07/2023	TRUE
PC002	LDEA01	MSCM	01/04/2024	08/05/2024	FALSE
PC003	ALAU02	NEAM	09/03/2020	10/03/2021	FALSE
PC004	LOLI75	GOUZ	07/06/2018	11/09/2018	TRUE

(i) Write a Structured Query Language (SQL) script to delete all placements that have been completed.

[2]

(ii) Write an SQL script to return the total number of placements completed by the student with ID LDEA01 at the company with ID NEAM. The total should be given an appropriate name.

[4]

(d) The database tables are repeated here:

```
STUDENT(StudentID, FirstName, TelephoneNumber, UniversityName)

PLACEMENT(PlacementID, StudentID, CompanyID, StartDate, EndDate,
          Complete)

COMPANY(CompanyID, CompanyName, MaxStudentsPerPlacement)
```

Explain what is meant by referential integrity, and how it applies to this database.

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..... [3]

4 A relational database, SHIPPING, stores data about the ships in a company and the containers that are carried on the ships.

The database has the following tables:

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CONTAINER(ContainerID, Type, Weight, OwnerName, ShipID)

SHIP(ShipID, Type, Capacity, ShipName)
```

(a) Describe the relationship between the two tables. Refer to the primary and foreign keys in your answer.

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..... [2]

(b) The table CONTAINER needs an additional field to store the data for the last inspection date.

Write a Structured Query Language (SQL) script to add **one** field to the table CONTAINER to store the date of last inspection of the container, for example 08/07/2019.

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..... [2]

(c) Write an SQL script to return the number of containers stored in the database for the ship with the name Caledonia.

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..... [4]

..... [2]

A 2x2 matrix diagram. The top horizontal axis is labeled 'CUSTOMER' on the left and 'PRODUCT' on the right. The left vertical axis is labeled 'COMPLAINT' on the top and 'STAFF' on the bottom. The four quadrants are empty.

[3]

StaffID	StaffFirstName	StaffLastName	Department	RemoteWorker
1	Ralph	Jura	E	Yes
2	Luca	Emcee	A	Yes
3	Darwin	Acula	F	No

[4]

[illegible]

(d) A Database Management System (DBMS) is used to maintain and manage the database.

Describe **two** ways in which the DBMS can be used to ensure the security of the customer data.

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- 2
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-
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[4]

Question 6 starts on the next page.