

COM2405

Compulsory question

1.

(a) Define Database Management Systems. Explain briefly the Data Independence and kinds of data independence in Database Systems.

(10 marks)

(b) Explain the ACID properties of a transaction.

(8 marks)

(c) Briefly explain the terms superkey, candidate key and primary key.

(6 marks)

(d) Explain what is meant by a *Cartesian Product* operation in a database. Give an example.

(4 marks)

(e) Modify the following SQL statement to add a constraint "only Joe's Bar can sell beer for more than \$5":

```
create table Sells (
    bar char(20),
    beer char(20),
    price real,
);
```

(4 marks)

(f) Consider the following relation for published books:

```
BOOK (Book_title, Authorname, Book_type, Listprice,
      Author_affil, Publisher)
```

Author_affil refers to the affiliation of the author. Suppose the following dependencies exist:

```
Book_title -> Publisher, Book_type
Book_type -> Listprice
Author_name -> Author-affil
```

(i) What normal form is the relation in? Explain your answer.

(ii) Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition.

(8 marks)

(Total 40 marks)

Please Turn Over