UNIVERSITY OF WESTMINSTER

SCHOOL OF COMUPTER SCIENCE AND ENGINEERING
In Class Test SEMESTER 1 2022/23

Module Code:	**7BUIS030W**
Module Title:	**Data System Concepts and Fundamentals**
Module Leader:	**Saumya Reni**
Release Time:	**14 December 2022 14:00**
Submission Deadline:	**14 December 2022 16:00**

Instructions to Candidates:

Please read the instructions below before starting the paper

- Module specific information is provided below by the Module Leader
- This is an individual piece of work so do not collude with others on your answers as this is an academic offence
- Plagiarism detection software will be in use
- Where the University believes that academic misconduct has taken place the University will investigate the case and apply academic penalties as published in Section 10 Academic Misconduct regulations.
-

Module Specific Information

This paper has **Three** questions with sub-questions worth 100 marks in total.
Answer **all** questions.
The overall marks awarded for each question are indicated next to the question.
The score of each sub-question is indicated next to the sub-question.
Answers with no working or justification will not gain full marks.
You may use a non-graphical/ nonprogrammable calculator.

Question 1: State whether the following is true or false with justifications

[2 marks each- 1 mark for correct answer and 1 mark for justification; Total 20 marks]

i. In relational database management system, all alternate keys are candidate keys.

ii. Antivirus protection software is installed in a personal computer as part of data protection.

iii. Having the same data entered multiple times in the same table is called Data inconsistency

iv. A data processor is a data actor that always determines the purpose and means of the personal data processing

v. A record in a database contains the corresponding entry of an attribute in a table

vi. A tuple is a column of relation in a relational data structure

vii. The SQL ‘create’ command is an example of a Data Definition Language

viii. The data subject is always a third-party who external to the organisation

ix. The run length encoding (RLE) is an example of lossy compression

x. A recursive relationship in a conceptual ERD can also be considered as another form of binary relationship

Question 2: Data Protection, Data Actors and Regulatory and Compliance Framework [Total 36 marks]

A vetting process is being carried out for a certain candidate who is participating in an election procedure to be the leader of the democratic party. The party executive committee is conducting this search internally. Answer the following:

i. Identify the data actors in this scenario, provide justifications and describe their roles. [18 Marks]

ii. Can the candidate refuse to provide his personal details? Justify how the candidate can steer this process based on at least four fundamental principles of data protection. [6 Marks]

iii. The party uses *BS10012:2017* regulations and compliance frameworks to maintain the data protection involving their potential members. State what this regulation stands for and explain the significance of these regulations? [4 Marks]

iv. The party website was hacked during the campaign and important information on the candidates were leaked. Identify what type of data security issue does this involve and describe its nature. [4 Marks]

v. State four data security measurements the party can take to avoid future issues. [4 Marks]

Question 3: Data life cycle **[Total 44 marks]**

Part 1: Conceptual and Logical ERDs

The conceptual ERD shown in the following Figure 1 is for a bookstore which sells copies of published books to customers.

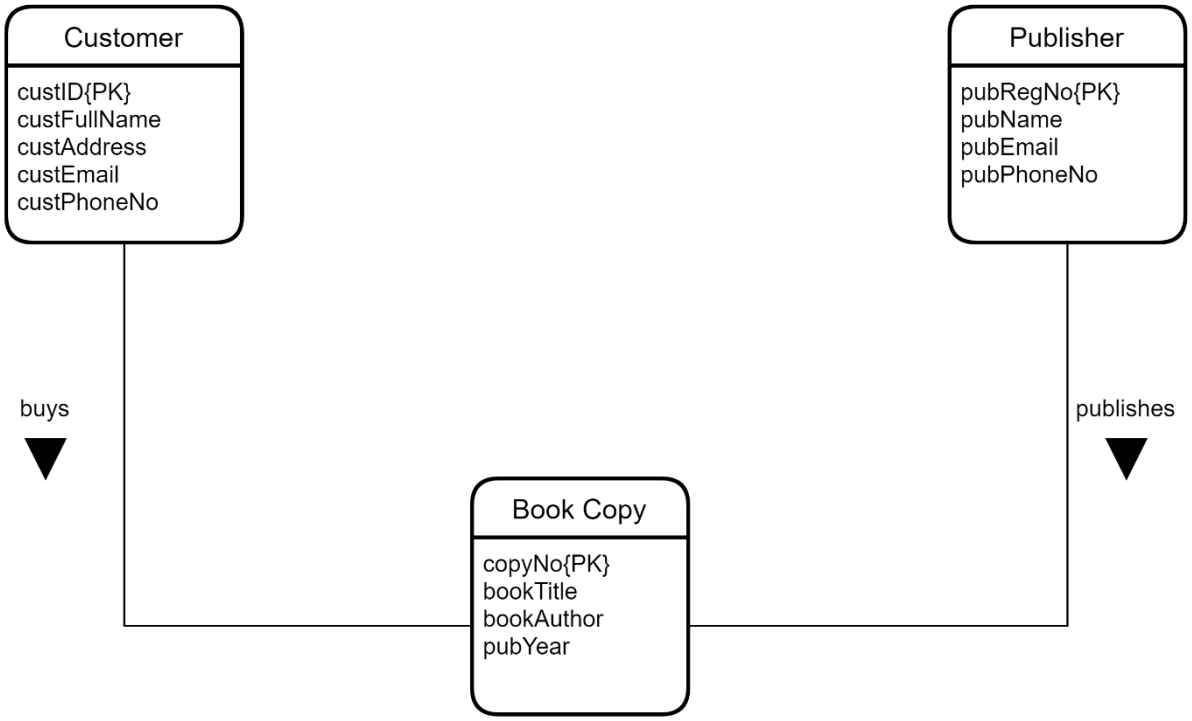

Figure 1

i. Complete the above ERD with multiplicities of relationship between each entity. [4 Marks]

ii. Identify the strong and weak entities in the above ERD and justify your answer. [4 Marks]

iii. Explain in detail the multiplicities of the relationship 'publishes' (between the entities publisher and book copy) by providing 4 meaningful statements. Also provide adequate justifications to support each statement. [8 Marks]

iv. Map the relationship 'buys' (between Customer and Book Copy) into a full logical data model. To do this, resolve the relationship between the entities and derive the associated relation (i.e., tables) with all the attributes, primary keys and foreign keys. You should also explain the mapping rules associated with this relationship, identifying the parent and the child tables.

[7 Marks]

Part 2: Query Language

v. Write an SQL query to create all the three entities into the Book store data base. Please carefully include all the foreign keys and constraint while creating the table. [21 Marks]

END OF PAPER