UNIVERSITY OF WESTMINSTER

SCHOOL OF COMUPTER SCEINCE AND ENGINEERING
In Class Test SEMESTER 1 2021/22

Module Code:	**7BUIS030W**
Module Title:	**Data System Concepts and Fundamentals**
Module Leader:	**Saumya Reni**
Release Time:	**Tuesday 16 December 2021 14:00**
Submission Deadline:	**Tuesday 16 December 2021 17:00**

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.
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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 [1 mark each; Total 10 marks]

i. Having the same data entered multiple times in the same table is called Data redundancy

ii. A data subject determines the purpose and means of the personal data processing

iii. A record in a database contains columns used to capture attributes in a table

iv. A tuple is a row of relation in a relational data structure

v. The SQL select command is an example of a Data Definition Language

vi. Data back up and system update are examples of data protection

vii. The data processor is always a third party external to the organisation

viii. Big data and Data mining procedures are large scale data extraction tools

ix. In DBMS, a primary key is always a candidate key but all candidate keys are not primary key.

x. A dictionary is a physical database

Question 2: Data Protection, Data Actors and Regulatory and Compliance Framework [Total 45 marks]

i. State any four fundamental principles of data protection. [4 Marks]

ii. What are data actors? Provide their names [4 Marks]

iii. Alex has been recently offered a job in an Asset management company as Data Analyst. The company has appointed the Bluespert agency to conduct background check on Alex before he starts his new job. Identify the data actors in this scenario, provide justifications and describe their roles. [16 Marks]

iv. The company uses regulations and compliance frameworks to maintain the Data protection involving their potential employees like Alex. What are the significance of these regulations? [4 Marks]

v. The company has established data security measures such as computing device protection using antivirus software and firewall. How do these Data security actions differ from data protection frameworks? [5 Marks]

xi. State the two types of data security issues. [4 Marks]

xii. Describe what type of data security issues will the following incidents pose:

a) A university network being hacked and all the students were sent spam emails from staff email address. [4 Marks]

b) A mobile phone being stolen, and the personal photos released [4 Marks]

Question 3: Data life cycle **[Total 45 marks]**

Part 1: Conceptual and Logical ERDs

The conceptual ERD shown in Figure 1 is for an art gallery which commissions artwork created by artists for customers.

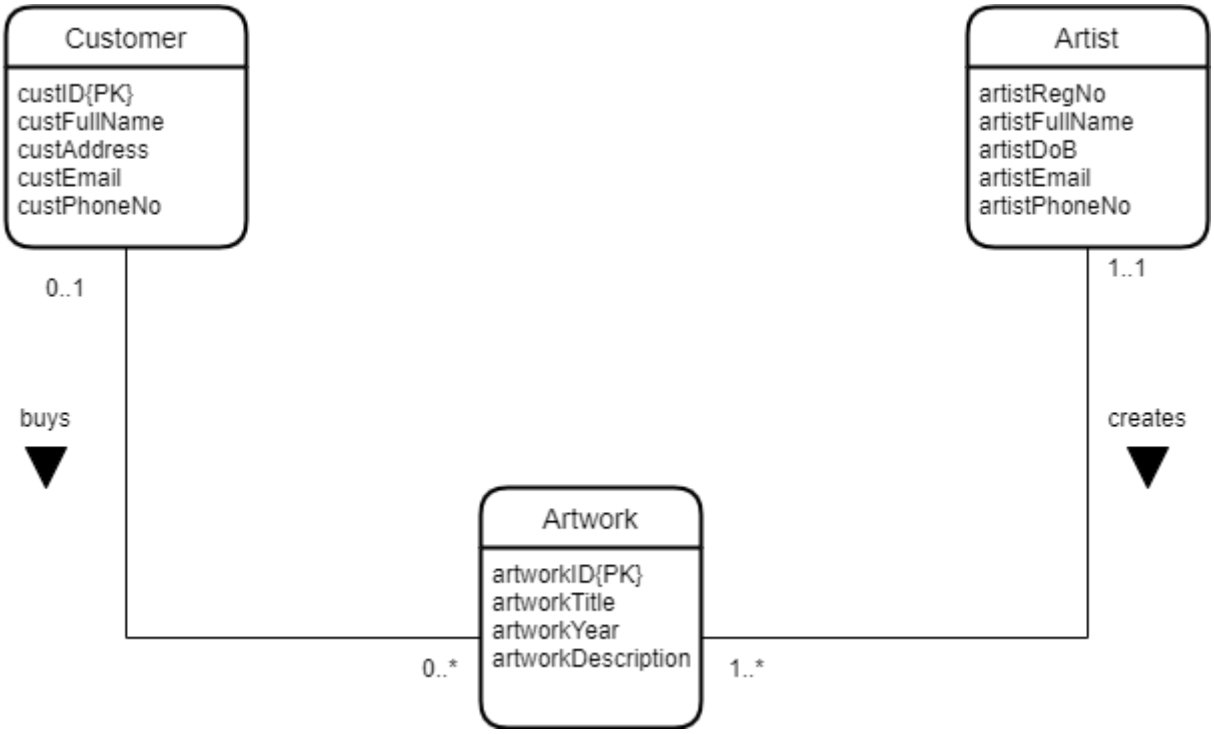

Figure 1

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

ii. Explain in detail the multiplicities of the relationship ‘creates’ (between the entities Artist and Artwork) by providing 4 meaningful statements. Also provide adequate justification to support each statement. [8 Marks]

iii. Map the relationship ‘buys’ (between Customer and Artwork) 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

iv. Write an SQL query to create all the three entities into the Art Gallery database. Please carefully include all the foreign keys and constraint while creating the table. [21 Marks]

v. Write a SQL query to title and year of release of all the artwork created in the year 2020 and has the word ‘dew’ or ‘autumn’ in their titles. [5 Marks]

END OF PAPER