UNIVERSITY OF WESTMINSTER

SCHOOL OF COMUPTER SCEINCE AND ENGINEERING
TIMED ASSESSMENT REFER/DEFER 2020/21

Module Code:	**5COSC002W**
Module Title:	**Database Systems**
Module Leader:	**Dr Francois ROUBERT**
Exam Start Time:	**9 July 2021 10:00 (BST)**
Recommended Exam End Time:	**9 July 2021 11:30 (BST)**
Submission Window:	**1 hr and 10 minutes**
Submission Deadline:	**9 July 2021 12:40 (BST)**

Instructions to Candidates:

Please read the instructions below before starting the paper

- Module specific information is provided below by the Module Leader
- The Module Leader will be available during the exam release time to respond to any queries via the Discussion Board in the Assessment area of the module's Blackboard site
- As you will have access to resources to complete your assessment any content you use from external source materials will need to be referenced correctly. Whenever you directly quote, paraphrase, summarise, or utilise someone else's ideas or work, you have a responsibility to give due credit to that person. Support can be found at:

  https://www.westminster.ac.uk/current-students/studies/study-skills-and-training/research-skills/referencing-your-work
- 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.
- ***Once completed please submit your paper via the Assignment content. In case of problems with submission, you will have TWO opportunities to upload your answers and the last uploaded attempt will be marked. Note that instructions on how to compile and submit your handwritten and/or typed solutions will have been sent to you separately.***
- ***Work submitted after the deadline will not be marked and will automatically be given a mark of zero***

Module Specific Information

ALL 4 QUESTIONS ARE MANDATORY, ANSWER ALL QUESTIONS

QUESTION 1 CARRIES 24 MARKS
QUESTION 2 CARRIES 24 MARKS
QUESTION 3 CARRIES 32 MARKS
QUESTION 4 CARRIES 20 MARKS

FixxTekk is a computer maintenance and repair business that specialises in fixing computer systems for corporate clients. Corporate firms can bring their computers to be fixed at FixxTekk and FixxTekk prides itself in providing high-quality support to ensure that all computers brought in are thoroughly checked and carefully fixed if required.

FixxTekk is seeking to design and develop a database-driven management system to help organise the management of the fixing of computers and the allocation of staff to these jobs.

The Conceptual Entity-Relationship Diagram (ERD) for the computer fixing management system for FixxTekk is shown on figure 1. Carefully consider this conceptual ERD and answer the questions below.

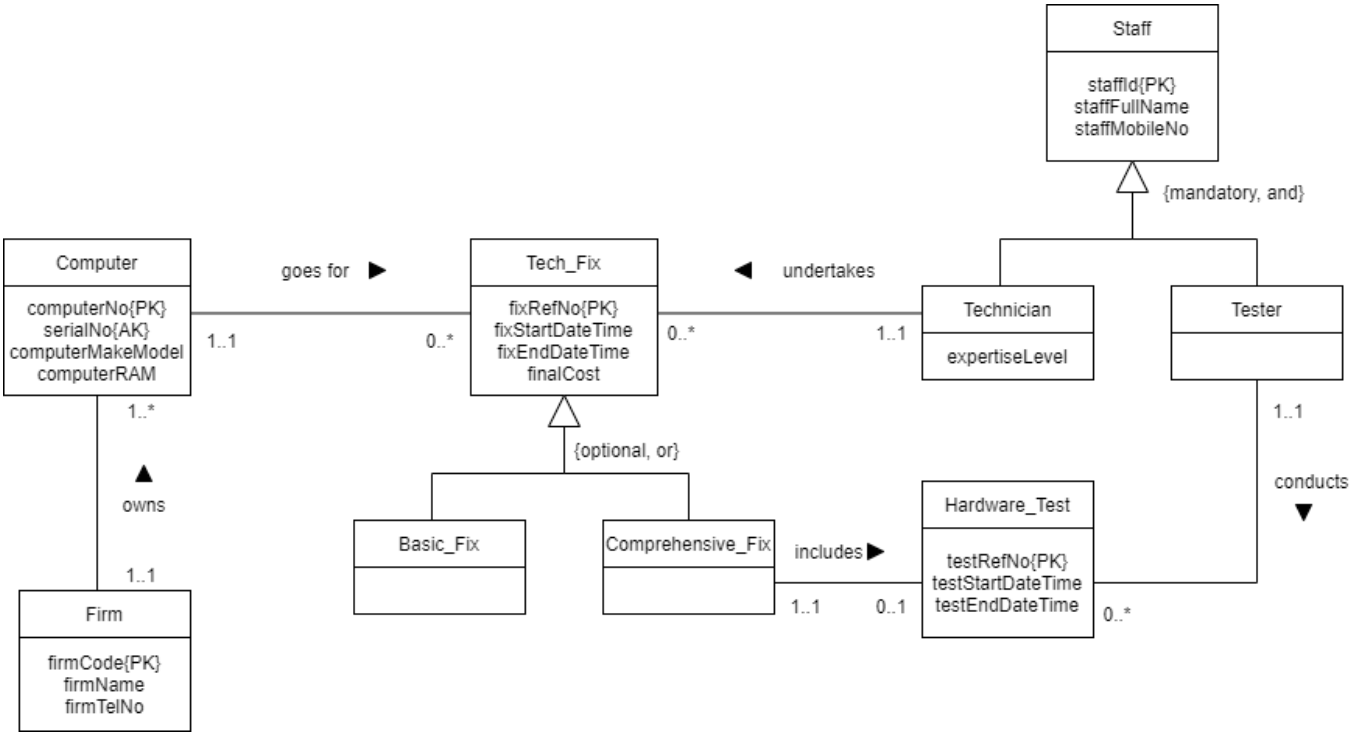

Figure 1: Conceptual ERD for the FixxTekk computer fixing management system.

Question 1

(a) Explain in detail the multiplicities of the relationship *'owns'* (between the entities Firm and Computer) by providing 4 meaningful statements along with 4 adequate justifications to support each statement.

[12 Marks]

(b) Explain in detail the multiplicities of the relationship *'includes'* (between the entities Comprehensive_Fix and Hardware_Test) by providing 4 meaningful statements along with 4 adequate justifications to support each statement.

[12 Marks]

Question 2

(a) Explain in detail what the connection is between the entity Staff and the entities Technician and Tester and explain what this technique is used for here. As part of your answer, explain the {mandatory, and} constraint and discuss attribute and relationship inheritance in this situation.

[12 Marks]

(b) Explain in detail what the connection is between the entity Tech_Fix and the entities Basic_Fix and Comprehensive_Fix and explain what this technique is used for here. As part of your answer, explain the {optional, or} constraint and discuss attribute and relationship inheritance in this situation.

[12 Marks]

Question 3

(a) Provide a detailed written explanation of how you would map the conceptual ERD for FixxTekk (figure 1) to a logical ERD.

[12 Marks]

(b) Create the mapped logical ERD for FixxTekk using a drawing tool (such as draw.io available at https://www.diagrams.net) and insert it in your exam answer document. Make sure you include all the correct elements in your diagram e.g. relationships, multiplicities, attributes, and keys.

[20 Marks]

Question 4

(a) Write a SQL query to retrieve the computer numbers, the makes and models and the RAM for those computers that are 'Dell' computers and that have less than 8 GB of RAM.

[08 Marks]

(b) Write a SQL query that lists all the details of the 'HP' Computers that are owned by the 'Google' firm or the 'British Airways' firm.

[10 Marks]

(c) Explain the following Data Control Language (DCL) statement.

```
GRANT SELECT, UPDATE (firmTelNo)
ON Firm
TO PUBLIC;
```

[02 Marks]

END OF EXAM