UNIVERSITY OF WESTMINSTER

SCHOOL OF COMUPTER SCIENCE AND ENGINEERING
TIMED ASSESSMENT SEMESTER 1 2020/21

Module Code:	**5COSC002W & 5COSC008C**
Module Title:	**Database Systems**
Module Leader:	**Dr Francois ROUBERT**
Release Time:	**Wednesday 06 January 2021 10:00 (GMT)**
Submission Deadline:	**Wednesday 06 January 2021 12:40 (GMT)**

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 COMPULSORY, ANSWER ALL QUESTIONS

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

VinyVan is a vehicle maintenance and repair business that specialises in servicing vans for corporate clients. Companies can bring their vans for a service at VinyVan and VinyVan prides itself in providing high-quality support to ensure that all vans brought in are thoroughly examined and carefully repaired if required.

VinyVan is seeking to design and develop a database-driven management system to help organise the management of the servicing of vans and the allocation of staff to these jobs.

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

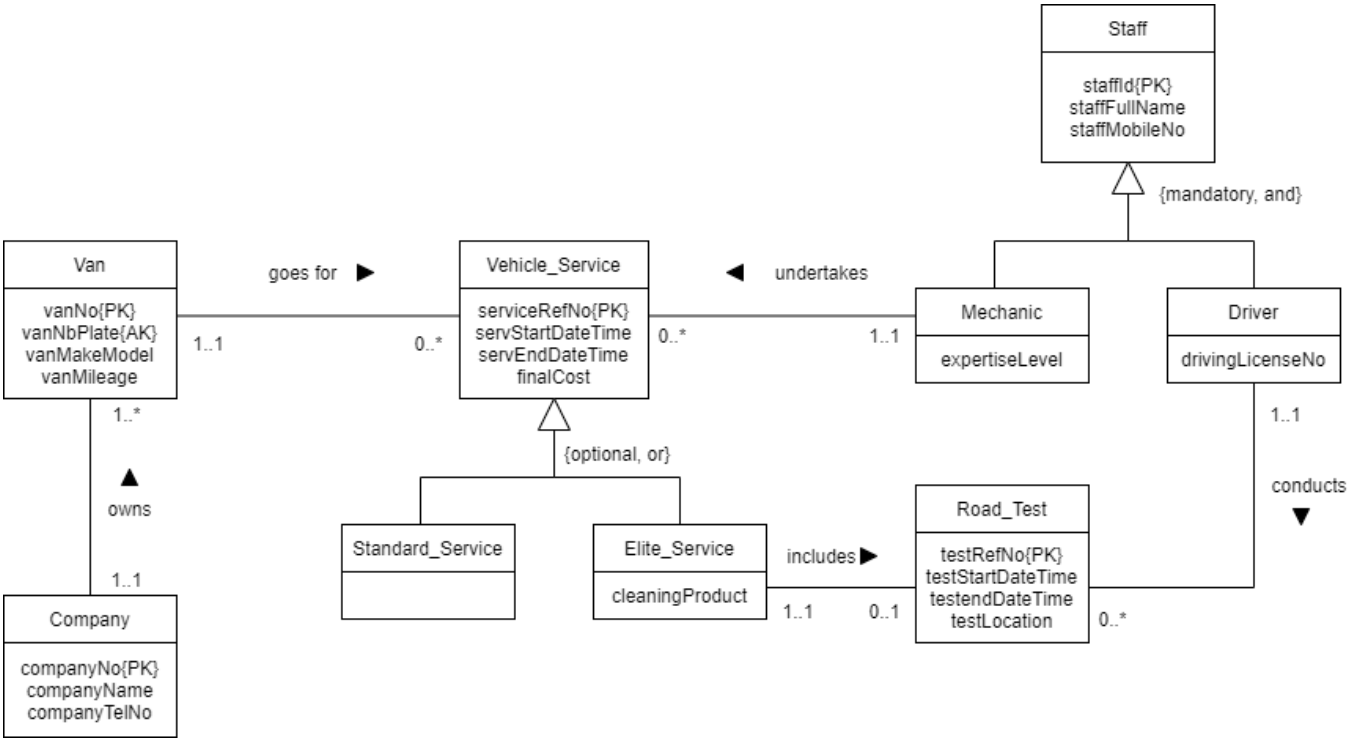

Figure 1: Conceptual ERD for the VinyVan van servicing management system.

Question 1

(a) Explain in detail the multiplicities of the relationship *'conducts'* (between the entities Driver and Road_Test) 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 Elite_Service and Road_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 Mechanic and Driver 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 Vehicle_Service and the entities Standard_Service and Elite_Service 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 VinyVan (figure 1) to a logical ERD.

[12 Marks]

(b) Create the mapped logical ERD for VinyVan 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 van numbers, the makes and models and the mileages for those vans that are 'Mercedes' vans and that have more than 100000 miles on their counters.

[08 Marks]

(b) Write a SQL query that lists all the details of the 'FORD' vans that are owned by the 'IKEA' company or the 'Argos' company.

[10 Marks]

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

```
GRANT SELECT, UPDATE (companyTelNo)
ON Company
TO Personnel;
```

[02 Marks]