THE INDEPENDENT INSTITUTE OF EDUCATION

MODULE NAME:	MODULE CODE:
DATABASES	DBAS6211/d

ASSESSMENT TYPE:	TEST (PAPER ONLY)
TOTAL MARK ALLOCATION:	60 MARKS
TOTAL HOURS:	1 HOUR (+5 minutes reading time)

INSTRUCTIONS:

1. *Please adhere to all instructions in the assessment booklet.*
2. *Independent work is required.*
3. *Five minutes per hour of the assessment to a maximum of 15 minutes is dedicated to reading time before the start of the assessment. You may make notes on your question paper, but not in your answer sheet. Calculators may not be used during reading time.*
4. *You may not leave the assessment venue during reading time, or during the first hour or during the last 15 minutes of the assessment.*
5. *Ensure that your name is on all pieces of paper or books that you will be submitting. Submit all the pages of this assessment's question paper as well as your answer script.*
6. *Answer all the questions on the answer sheets or in answer booklets provided. The phrase 'END OF PAPER' will appear after the final set question of this assessment.*
7. *Remember to work at a steady pace so that you are able to complete the assessment within the allocated time. Use the mark allocation as a guideline as to how much time to spend on each section.*

Additional instructions:

1. *This is an OPEN BOOK assessment.*
2. *Calculators are allowed.*
3. *For open book assessments the students may have open access to all resources inclusive of notes, books (hardcopy and e-books) and the internet. These resources may be accessed as hard copies or as electronic files on electronic devices. All electronic devices batteries must be fully charged before the assessment as no charging of devices will be permitted during the sitting of the assessment. The IIE and associated brands accept no liability for the loss or damage incurred to electronic devices used during open book assessments.*
4. *Answer All Questions.*
5. *Instructions for assessments including practical computer work:*
    - *Use of good programming practice and comments in code is compulsory.*
    - *Save your application in the location indicated by the administrator (e.g. the Z:\ drive or your local drive).*
    - *Create a folder as follows: use the module code and your own student number and create a folder with a folder name as per the format shown here:*
    - ***StudentNumber_ModuleCode_Test**. Save all files (including any source code files, template files, design files, image files, text files, database files, etc.) within this folder.*

- *E.g. if your student number is 12345, and you are writing an examination for the module PROG121, create a folder named* ***12345_Prog121_Test*** *and use this throughout the session to save all of your files.*
- ***Important:*** *Upon completion of your assessment, you must save and close all your open files and double click the ExamLog application on your desktop. You must follow the instructions carefully to ensure that the information about the files that you have submitted for this assessment has been logged on the network. Specify the location of your source code on your question paper.*

Question 1 – Entity Relationship Diagrams (Marks: 20)

Answer this question in your answer script/answer booklet provided.

Draw an Entity Relationship Diagram (**ERD**) using Unified Modelling Language (**UML**) notation according to the below business rules. Your design should be at the **logical level** – include primary and foreign key fields and remember to remove any many-to-many relationships.

Tip: Pay attention to the mark allocation shown below.

Business rules of a college that wants to keep track of their registered students:

1. All entities should have surrogate primary keys.
2. Each student registers to study at a specific campus. When a new campus is established, it can initially be recorded in the database without any students being registered there.
3. The name and surname of each student must be recorded in the database.
4. The name of each campus must be stored in the database.
5. Every student registers for many modules over time, and every module can be taken by many students.
6. Students may register for the same module in multiple years, so the year in which a student registers for a particular module also needs to be stored.
7. The module code and name of every module must be stored in the database.
8. Each module belongs to exactly one faculty, and a faculty owns many modules. A new faculty may be recorded in the database before the creation of its first module.
9. The name of each faculty must be stored in the database.

Marks will be awarded as follows:

Entities	5 marks
Relationships	4 marks
Multiplicities	4 marks
Primary keys	2 marks
Foreign keys	2 marks
Other attributes	2 marks
Correct UML Notation	1 mark
Total	**20 marks**

Question 2 – Normalisation (Marks: 20)

Answer this question in your answer script/answer booklet provided.

The college has already collected a lot of data in a spreadsheet (an extract from the spreadsheet is shown below). The data has been normalised to first normal form already – underlined column names indicate composite primary key columns.

Student Number	Student Name	Module Code	Module Name	Faculty Code	Faculty Name	Year of Registration	Mark
20000892	H. Petu	MAPC5112	Maths	F001	Commerce	2020	46
20000892	H. Petu	MAPC5112	Maths	F001	Commerce	2021	58
20000892	H. Petu	DBAS6211	Databases	F002	ICT	2021	97
19001010	A. Nixon	DBAS6211	Databases	F002	ICT	2021	72
19001010	A. Nixon	MAPC5112	Maths	F001	Commerce	2019	51

Note: A student may register more than once for the same module, but only once per year.

Normalise the above data to **second normal form (2NF)**. Show all steps as well as the final answer in the form of **dependency diagrams**.

Question 3 – SQL (Marks: 20)

Practical Computer Work: The answer for this question should be submitted electronically.

Using MySQL, create a **single** Structured Query Language (**SQL**) **script** that answers all the questions on the next page. Include **comments** to indicate which part of the script answers which question.

The script **must execute correctly** using MySQL to get full marks.

Make use of the following Entity Relationship Diagram (ERD) and Data Dictionary:

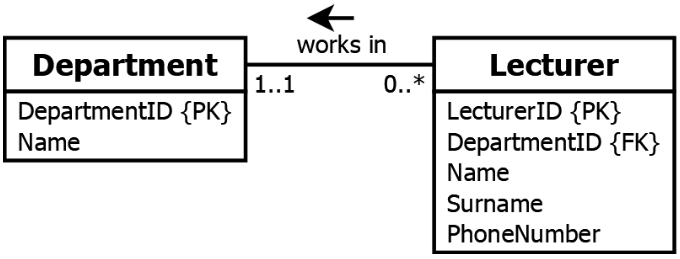

Table: Department

Field name	Data type	Data format	Field size	Req?	Description	Example
DepartmentID {PK}	int			Yes	Autonumber primary key that uniquely identifies a department	14
Name	varchar(100)		100	Yes	Name of the department	Information and Communication Technologies

Table: Lecturer

Field name	Data type	Data format	Field size	Req?	Description	Example
LecturerID {PK}	int			Yes	Autonumber primary key that uniquely identifies a lecturer	5
DepartmentID {FK}	int			Yes	Foreign key that identifies the department of the lecturer	14
Name	varchar(100)		100	No	Name of the lecturer	Bob
Surname	varchar(100)		100	No	Surname of the lecturer	Jobs
PhoneNumber	char(10)	0000000000	10	No	Phone number of the lecturer	0123456789

Q.3.1	Write SQL statements to:		
	Q.3.1.1	Create the schema, called college_<your student number>. For example: college_20987654.	(2)
	Q.3.1.2	Create the Department table.	(4)
	Q.3.1.3	Create the Lecturer table with the foreign key constraint.	(8)
Q.3.2	Write SQL statements to insert the following data:		(6)

Table: Department

DepartmentID	Name
1	Information and Communication Technologies
2	Commerce

Table: Lecturer

LecturerID	DepartmentID	Name	Surname	PhoneNumber
1	1	Bob	Jobs	0123456789
2	1	Sue	McDonald	0110123456

END OF PAPER