



MODULE NAME:	MODULE CODE:
DATABASE (INTRODUCTION)	DATA6211/p/d

ASSESSMENT TYPE:	TAKE-HOME EXAM (PAPER ONLY)
TOTAL MARK ALLOCATION:	120 MARKS
TOTAL TIME:	21 HOURS (midnight to 9PM on the same day)

By submitting this assessment, you acknowledge that you have read and understood all the rules as per the terms in the registration contract, in particular the assignment and assessment rules in The IIE Assessment Strategy and Policy (IIE009), the intellectual integrity and plagiarism rules in the Intellectual Integrity and Property Rights Policy (IIE023), as well as any rules and regulations published in the student portal.

INSTRUCTIONS:

1. Please **adhere to all instructions**. These instructions are different from what is normally present, so take time to go through these carefully.
2. **Independent work is required**. Students are not allowed to work together on this assessment. Any contraventions of this will be handled as per disciplinary procedures in The IIE policy.
3. **No material may be copied from original sources, even if referenced correctly, unless it is a direct quote indicated with quotation marks.**
4. All work must be adequately and correctly referenced.
5. You should paraphrase (use your own words) the concepts that you are referencing, rather than quoting directly.
6. This is an open-book assessment.
7. Assessments must be typed unless otherwise specified.
8. **Ensure that you save a copy of your responses.**
 - 8.1. Complete your responses in a Word document.
 - 8.2. The document name must be your **name.student number.Module Code**.
 - 8.3. Once you have completed the assessment, upload your document under the **submission link** in the correct module in Learn.

Additional instructions:

- Answer All Questions.

Referencing Rubric

Providing evidence based on valid and referenced academic sources is a fundamental educational principle and the cornerstone of high-quality academic work. Hence, The IIE considers it essential to develop the referencing skills of our students in our commitment to achieve high academic standards. Part of achieving these high standards is referencing in a way that is consistent, technically correct and congruent. This is not plagiarism, which is handled differently.

Poor quality formatting in your referencing will result in a penalty of according to the following guidelines a maximum of ten percent being deducted from the overall percentage. Please note, however, that evidence of plagiarism in the form of copied or uncited work (not referenced), absent reference lists, or exceptionally poor referencing, may result in action being taken in accordance with The IIE's Intellectual Integrity Policy (0023).

Markers are required to provide feedback to students by indicating (circling/underlining) the information that best describes the student's work.

Minor technical referencing errors: 5% deduction from the overall percentage. – the student's work contains five or more errors listed in the minor errors column in the table below.

Major technical referencing errors: 10% deduction from the overall percentage. – the student's work contains five or more errors listed in the major errors column in the table below.

If both minor and major errors are indicated, then 10% only (and not 5% or 15%) is deducted from the overall percentage. The examples provided below are not exhaustive but are provided to illustrate the error.

Required: Technically correct referencing style	Minor errors in technical correctness of referencing style Deduct 5% from overall percentage. Example: if the response receives 70%, deduct 5%. The final mark is 65%.	Major errors in technical correctness of referencing style Deduct 10% from the overall percentage. Example: if the response receives 70%, deduct 10%. The final mark is 60%.
Consistency <ul style="list-style-type: none"> The same referencing format has been used for all in-text references and in the bibliography/reference list. 	Minor inconsistencies. <ul style="list-style-type: none"> The referencing style is generally consistent, but there are one or two changes in the format of in-text referencing and/or in the bibliography. For example, page numbers for direct quotes (in-text) have been provided for one source, but not in another instance. Two book chapters (bibliography) have been referenced in the bibliography in two different formats. 	Major inconsistencies. <ul style="list-style-type: none"> Poor and inconsistent referencing style used in-text and/or in the bibliography/ reference list. Multiple formats for the same type of referencing have been used. For example, the format for direct quotes (in-text) and/or book chapters (bibliography/ reference list) is different across multiple instances.
Technical correctness <ul style="list-style-type: none"> Referencing format is technically correct throughout the submission. The correct referencing format for the discipline has been used, i.e., either APA, OR Harvard OR Law Position of the reference: a reference is directly associated with every concept or idea. For example, quotation marks, page numbers, years, etc. are applied correctly, sources in the bibliography/reference list are correctly presented. 	Generally, technically correct with some minor errors. <ul style="list-style-type: none"> The correct referencing format has been consistently used, but there are one or two errors. Concepts and ideas are typically referenced, but a reference is missing from one small section of the work. Position of the references: references are only given at the beginning or end of every paragraph. For example, the student has incorrectly presented direct quotes (in-text) and/or book chapters (bibliography/reference list). 	Technically incorrect. <ul style="list-style-type: none"> The referencing format is incorrect. Concepts and ideas are typically referenced, but a reference is missing from small sections of the work. Position of the references: references are only given at the beginning or end of large sections of work. For example, incorrect author information is provided, no year of publication is provided, quotation marks and/or page numbers for direct quotes missing, page numbers are provided for paraphrased material, the incorrect punctuation is used (in-text); the bibliography/reference list is not in alphabetical order, the incorrect format for a book chapter/journal article is used, information is missing e.g. no place of publication had been provided (bibliography); repeated sources on the reference list.
Congruence between in-text referencing and bibliography/ reference list <ul style="list-style-type: none"> All sources are accurately reflected and are all accurately included in the bibliography/ reference list. 	Generally, congruence between the in-text referencing and the bibliography/ reference list with one or two errors. <ul style="list-style-type: none"> There is largely a match between the sources presented in-text and the bibliography. For example, a source appears in the text, but not in the bibliography/ reference list or vice versa. 	A lack of congruence between the in-text referencing and the bibliography. <ul style="list-style-type: none"> No relationship/several incongruencies between the in-text referencing and the bibliography/reference list. For example, sources are included in-text, but not in the bibliography and vice versa, a link, rather than the actual reference is provided in the bibliography.
In summary: the recording of references is accurate and complete.	In summary, at least 80% of the sources are correctly reflected and included in a reference list.	In summary, at least 60% of the sources are incorrectly reflected and/or not included in reference list.

Overall Feedback about the consistency, technical correctness and congruence between in-text referencing and bibliography:

Question 1**(Marks: 5)**

A database management system (DBMS) performs several important functions. One such function is **data dictionary management**.

Describe this function and explain why this function is important.

Question 2**(Marks: 5)**

Consider the ER diagram below and answer the questions that follow.



Q.2.1 What notation is used in the ER diagram above? (1)

Q.2.2 What is the relationship between the two entities depicted in the ER diagram above? Name and describe this relationship. (4)

Question 3**(Marks: 40)**

Q.3.1	What is the objective of the normalisation process?	(6)
--------------	---	-----

Q.3.2	When is a table in second normal form (2NF)?	(2)
--------------	--	-----

Q.3.3	When is a table in third normal form (3NF)?	(2)
--------------	---	-----

Consider the table in first normal form (1NF) below, then answer Questions 3.4 and 3.5.

Database name: Photographer_Photos

Table name: DATA_ORG_1NF

PHOTOGRAPHER ID	PHOTOGRAPHER NAME & SURNAME	PHOTO ID	PHOTO DESCRIPTION	GENRE ID	GENRE DESCRIPTION
A001	Thabo Ndlovu	B001	Lion's Pride	C001	Wildlife
A002	Clark Grobler	B002	Prada Proud	C002	Fashion
A003	Sbonelo Mthaba	B003	Flower Arrangement	C004	Still Life Photos
A004	Teagan Boland	B004	Rush Hour Traffic	C003	Street Photos
A001	Thabo Ndlovu	B005	Taking Flight	C001	Wildlife
A003	Sbonelo Mthaba	B006	Worker Protests	C005	Photojournalism
A002	Clark Grobler	B007	Oakley Summer 2023	C002	Fashion
A001	Thabo Ndlovu	B008	Farm Life	C001	Wildlife
A002	Clark Grobler	B009	Antique Chair	C004	Still Life Photos

Q.3.4	Normalise the table presented above to second normal form (2NF), showing all steps with explanations. All steps and the final answer must be in dependency diagram format.	(15)
--------------	--	------

Q.3.5	Once you have answered Question 3.4, extend your answer to normalise the table above to the third normal form (3NF), showing all steps with explanations. All steps and the final answer must be in dependency diagram format.	(15)
--------------	--	------

Question 4**(Marks: 25)**

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.

- Each owner owns one or more cats, and every cat has exactly one owner.
- The name and surname of each owner must be stored in the database.
- The name of each cat must be stored in the database.
- Each cat belongs to one specific breed, and many cats can belong to the same breed.
- The description of each breed must be stored in the database.
- A cat can enter many competitions, and many cats can enter the same competition.
- The description of each competition must be stored in the database.

Tip: Pay attention to the mark allocation shown below.

Marks will be awarded as follows:

Entities	5 marks
Relationships	4 marks
Multiplicities	4 marks
Primary keys	5 marks
Foreign keys	4 marks
Other attributes	2 marks
Correct UML Notation	1 mark
Total	25 marks

Question 5**(Marks: 45)**

Consider your ERD answer to Question 4 and answer the questions that follow.

Q.5.1 Write the SQL code that will create the table structure for the table that stores the cat details. (10)

Q.5.2 Write the SQL code to populate the table that stores the breeds with data. (10)

Populate the table with the following breed descriptions:

- Siamese
- Burmese
- Sphynx
- Persian
- Maine Coon

Also, write the SQL code to display the contents of the table once the table has been populated.

Q.5.3 Assume that the database has been populated with data. Write the SQL code to list all the cats belonging to owner Thabo Ndlovu in ascending alphabetical order. (10)

Q.5.4 Assume that the database has been populated with data. Write the SQL code to generate the report shown below. This report lists the breeds in ascending alphabetical order with the number of cats that belong to that breed. (15)

BREED	NUMBER OF CATS
Burmese	2
Maine Coon	1
Persian	2
Siamese	1
Sphynx	3

END OF PAPER