



## Unit: Databases

# Sample Marking Scheme

Markers are advised that, unless a task specifies that an answer be provided in a particular form, then an answer that is correct (factually or in practical terms) **must** be given the available marks. If there is doubt as to the correctness of an answer, the relevant NCC Education materials should be the first authority.

This marking scheme has been prepared as a **guide only** to markers and there will frequently be many alternative responses which will provide a valid answer.

Each candidate's script must be fully annotated with the marker's comments (where applicable) and the marks allocated for each part of the tasks.

**Throughout the marking, please credit any valid alternative point.**

**Where markers award half marks in any part of a task, they should ensure that the total mark recorded for the task is rounded up to a whole mark.**

**Marker's comments:**

**Moderator's comments:**

**Mark:**

**Moderated mark:**

**Final mark:**

**Penalties applied for academic malpractice:**

## Task 1 Analysis and Design (LO 1, 3, 4) – 45 Marks

Produce the following documents:

- a) Identify and discuss your chosen organisation, with a minimum of SIX (6) entities, and outline the likely data and information that the company would require. List and explain the functions and transactions that a database application might perform that would support some of the day to day functions of the organisation. Summarise the advantages of a DBMS to the organisation.

(15 marks)

- a) Draw an ERD (Entity Relationship Diagram) that shows data entities that have been identified in part a) and how they relate to one another. The ERD should support the transactions that have been identified in part a) and should be fully normalised to 3<sup>rd</sup> normal form (3NF)

(20 marks)

- b) Create a data dictionary for the entity relationship diagram using the entities identified in part b). The data dictionary should identify the tables, attributes, primary and foreign keys, data types and any constraints/ business rules from your chosen organisation.

(10 marks)

Part a) AC 1.1, 1.5, 1.6				
0-3 marks	4-5 marks	6-8 marks	9-12 marks	12-15 marks
No or Insufficient discussion to provide clarity.	Organisation identified but have limited information  Limited (incomplete) description of data functions / transactions of DBMS  At least 5 appropriate entities identified.	Organisation <b>clearly identified, some</b> relevant advantages of DBMS but there are some gaps in the content that hinders full understanding  Description of <b>key</b> data functions / transactions of DBMS but are limited  At least 6 appropriate entities identified.	Organisation <b>clearly identified most</b> relevant advantages of DBMS but has some limited or missing information  <b>Clear, consistent</b> description of <b>most</b> data /functions / transactions of DBMS  At least 6 appropriate entities identified.	Organisation <b>clearly identified detailed insightful discussion</b> of relevant advantages of DBMS, higher marks will be awarded for level of detail and clarity shown by candidates in their discussions.  <b>Comprehensive discussion / justification</b> of data/ functions / transactions of DBMS that have been clearly identified and documented to a high level  At least 6 appropriate entities identified.

<b>Part b)</b>				
<b>0-5 marks</b>	<b>6-7 marks</b>	<b>8-11 marks</b>	<b>12-15 marks</b>	<b>16-20 marks</b>
No ERD has been produced or an ERD with inappropriate and/or incorrect entities and/or relationships.	ERD is produced with some incorrect aspects.	ERD represents key relevant entities / relationships / cardinality. May omit some important areas and could include some errors.	A fully realised ER model is produced in 3NF with minor errors. Eg. There might be some minor errors with cardinality or optionality	A fully realised ER model is produced in 3NF that provides the organisation with basis for a working system for all data/information and transactions indicated within the original scope. Higher marks will be awarded for level of clarity and detail shown by candidates in their discussions.  Differentiate marks in the band by the relevance to scenario and quality/ level of detail (e.g. appropriate attributes)
<b>Part c) AC 4.1, 4.2</b>				
<b>0-2 marks</b>	<b>3 marks</b>	<b>4-5 marks</b>	<b>6-7 marks</b>	<b>8-10 marks</b>
No data dictionary has been produced or a very basic data dictionary is produced with missing or incorrect elements.	DD identifies <b>all tables from ERD</b> ,  <b>Some appropriate attributes, keys</b> , but incomplete or some errors.	DD identifies <b>all tables from ERD</b> ,  <b>Most attributes, keys identified</b>  Some errors or omissions	<b>A full DD (all tables, relevant attributes, keys, constraints consistent with ERD)</b>  may contain trivial, missing or incorrect elements	<b>A full and clear data dictionary is produced without significant error.</b> Comprehensive, correct, appropriate integrity constraints. Is consistent with the ER diagram. Higher marks will be awarded where candidates show a high level of understanding and detail shown within the data dictionary

## Task 2 (LO 4, 5) – 40 Marks

- a) Create all the normalised tables in SQL. Show your SQL scripts and the finished tables. (10 marks)
- b) Enter sample data in all tables (minimum THREE (3) rows per table). (10 marks)
- c) Write at least FIVE (5) queries that show your understanding of SQL. SQL statements that should be used should include: Select, Update, Delete, From, Where, And, Count, Ascending, Order By. TWO (2) of the queries should join TWO (2) or more tables together (20 Marks)

<b>Part a)</b>				
<b>0-2 marks</b>	<b>3 marks</b>	<b>4-5 marks</b>	<b>6-7 marks</b>	<b>8-10 marks</b>
<i>Scripts for 0 or some tables</i> but the task is not fully addressed and there's significant issues with the creation of tables.	<i>Scripts for most tables</i> but there are <b>some important errors</b> (e.g. primary keys and / or foreign keys not enforced / data types are poorly selected).	<i>Scripts for all tables but there are errors</i> (e.g. primary and/or foreign keys are not enforced; in some cases, some columns are missing).	<i>Scripts for all tables. Only trivial errors</i> exist (such as formatting / misspelling of tables or column names, or minor inconsistency with DD).	<i>Scripts for all tables without error.</i> Completely consistent with DD. Higher marks will be awarded for the quality and range of SQL statements
<b>Part b)</b>				
<b>0-2 marks</b>	<b>3 marks</b>	<b>4-5 marks</b>	<b>6 -7 marks</b>	<b>8-10 marks</b>
<i>Scripts for 0 or some tables</i> showing a very limited attempt (e.g. not all tables have been populated and there's less than 3 rows of data for each table).	<i>Scripts are shown for all tables</i> but there are <b>some important errors</b> (e.g. missing not null columns).	<i>Scripts are shown for all tables</i> showing population with <b>some data for every table but there are some minor errors.</b>	<i>Scripts are shown for all tables.</i> Populated with at least 3 rows of data for each table  Only <b>trivial errors</b> exist.	<i>Scripts are shown for all tables.</i> Populated with at least 3 rows of data for each table.  No errors or very minor trivial errors.  <b>Differentiate marks in the band by the quality / quantity of data.</b>
<b>Part c)</b>				
<b>0-5 marks</b>	<b>6-7 marks</b>	<b>8-11 marks</b>	<b>12-15 marks</b>	<b>16-20 marks</b>
<i>Scripts for 0 or some tables</i> showing no use or a very limited use of SQL (e.g. only Select	At least FIVE (5) queries have been written but there's a <b>small selection of SQL</b> that has been used (e.g. only Select / From	At least FIVE (5) queries have been written and there is a <b>most required SQL</b> statements have been used with	At least FIVE (5) queries have been written and <b>all SQL statements have been used</b> (Select, Update, Delete, From,	Scripts as for (12-13) with no errors.  Differentiate marks in the band by the relevance to scenario and

statements are shown).	statements have been used).	<b>two (2) queries containing links to two (2) or more tables</b> but there is some minor errors with the statements.	Where, And, Count, Ascending, Order By) and <b>two (2) queries containing links to two (2) or more tables</b> but there is some trivial errors with the statements.	complexity of SQL.
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### Task 3 (LO 3)– 15 Marks

Provide a written assessment and evaluation of the work you have undertaken  
Your discussion should include:

- How well your database meets the data and information requirements of your chosen organisation.
- Any assumptions that you have made and how they impact the design.
- How the database supports the transactions that you identified in task.
- Any problems you had with your ER model and how you overcame them

0-3 marks	4-5 marks	6-8 marks	9-11 marks	12-15 marks
Little or no discussion of assumptions that have been made.	Very few assumptions have been identified or a poorly documented.	Discussion of some assumptions (e.g. there's some key assumptions missing).	Clear discussion of most assumptions with impact	Clear and coherent discussion of assumptions and their impact. Higher marks will be awarded for the level of detail and use of technical terms demonstrated by students in their discussions.
Little or no relevant evaluation of data requirements and solution..	Some evaluation of data requirements and solution	Clear evaluation of how the database meets the key data requirements of the chosen organisation (e.g. an attempt has been made at the discussion of identifying data and information requirements but there's some points omitted).	Clear evaluation of how the database meets almost all the data requirements of the chosen organisation (e.g. there is some minor points that have been omitted).	Complete and detailed evaluation of how the database meets the data requirements of the chosen organisation. Higher marks will be awarded where candidates show clear links between the initial requirements and the completed database.

Little or no discussion relating to how the database supports the transactions	A few (limited) transactions discussed with significant omissions.	Most transactions have been discussed but there's some key points missing.	All transactions have been discussed but there's some trivial minor points omitted.	Demonstrates excellent, clear and coherent discussion of all transactions. Higher marks will be awarded depending on the level of discussion by candidates.
Little or no discussion of ERD problems and solutions.	Some ERD problems identified, but unclear or no approach to solution.	Some ERD problems clearly identified with an approach to solution.	<b>Clear</b> identification of ERD problems and approach to solution of most.	Clear identification of ERD problems and systematic approach to solution of all. Higher marks will be awarded to those candidates who are able to demonstrate clear and consistent knowledge of ERDs and their importance in the development of the database.

<b>Task</b>	<b>LO's assessed by Assignment</b>	<b>Marker can differentiate between varying levels of achievement</b>
1	1, 3, 4	Yes
2	4, 5	Yes
3	3	Yes

## Grade descriptors

<b>Learning Outcome</b>	<b>Fail</b>	<b>Referral</b>	<b>Pass</b>	<b>Merit</b>	<b>Distinction</b>
Understand the concepts associated with database systems	Can basically identify, adapt and use appropriate skills, methods and procedures to reach basic solutions.	In a limited way, can identify, adapt and use appropriate skills, methods and procedures to reach limited solutions.	Can adequately Identify, adapt and use appropriate skills, methods and procedures to reach appropriate solutions.	Can soundly identify, adapt and use appropriate skills, methods and procedures to reach supported and appropriate solutions.	Can coherently identify, adapt and use appropriate skills, methods and procedures to reach well supported and highly appropriate solutions.
Understand the concepts associated with the relational model	Can basically identify, adapt and use appropriate skills, methods and procedures to reach basic solutions.	In a limited way, can identify, adapt and use appropriate skills, methods and procedures to reach limited solutions.	Can adequately Identify, adapt and use appropriate skills, methods and procedures to reach appropriate solutions.	Can soundly identify, adapt and use appropriate skills, methods and procedures to reach supported and appropriate solutions.	Can coherently identify, adapt and use appropriate skills, methods and procedures to reach well supported and highly appropriate solutions.
Understand how to design and develop a database system	Demonstrates basic ability to review the effectiveness and appropriateness of actions methods and results	Demonstrates limited ability to review the effectiveness and appropriateness of actions methods and results	Demonstrates adequate ability to review the effectiveness and appropriateness of actions methods and results	Demonstrates sound ability to review the effectiveness and appropriateness of actions methods and results	Demonstrates comprehensive ability to review the effectiveness and appropriateness of actions methods and results
Be able to develop a logical database design	Use basic research to inform basic actions/ conclusions	Use limited research to inform limited actions/ conclusions	Use appropriate research to inform actions/ conclusions	Use detailed research to inform actions/ conclusions	Use thorough and detailed research to inform well supported actions
Be able to develop a database system using SQL	Use basic research to inform basic actions/ conclusions	Use limited research to inform limited actions/ conclusions	Use appropriate research to inform actions/ conclusions	Use detailed research to inform actions/ conclusions	Use thorough and detailed research to inform well supported actions