

National College of Ireland

**Higher Diploma in Science in Computing**

HDCSDEV\_INT, HDAIML\_SEPOL\_HDBC\_SEPOL\_HDSDEV\_SEP, HDCYB\_SEPOL\_HDWD\_SEPOL, HDSDEV\_JAN\_HDAIML\_JANOL, HDSDEV\_JAN21OL, HDSDEV\_SEPOL\_YR1, CIC\_FEBOL

**Terminal Assignment-based Assessment (Repeat – 2021/22)**

**Submission Deadline:**

Wednesday 17th August (23.59)

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**Introduction to Databases**

Dr David Hamill

**Complete all 4 tasks outlined. Read detailed requirements carefully**. Overall total is 100 marks.

Microsoft Word should be used to complete this assessment. The submission document’s filename should contain the Student ID number.

***This is an individual personal assignment, co-operation or collaboration among students is strictly not allowed and may result in disqualification. Students may be asked to outline/explain in person the reason for any approach taken or solution provided.***

**No Attachments**: statistical tables, formulae or reference material should be individually sourced as required.

1. ***Entity Relational Diagram:***

Egnaro Ltd is a specialist coffee manufacturer. After a decision in the business the company has decided to move the business on-line. This will involve the company keeping online data in a database relating to products, customers, suppliers and orders at a minimum. You must now work with Egnaro Ltd to define the best structure for such a dataset. You must also support the company in understanding database security, roles and responsibilities. You must answer all questions below in a report format and use appropriate referencing style throughout. In addition you must provide all SQL and DDL statements is a separate .SQL file

* Draw an ER Diagram for the dataset then transform the conceptual design (ER diagram) into a physical design by converting the entities and relationships into their appropriate tables. Check if your tables are normalized using 1st, 2nd, and 3rd normal form. [*10 Marks*]
* Create a database called Egnaro and convert all the resulting logical tables from part 1 into a physical database design using DDL. Choose the appropriate datatype, primary and foreign keys for the attributes. Provide detailed assumptions for any of your design decisions. [*15 Marks*]

*(Total 25 marks)*

1. ***Data Security***

Differentiate between Authorisation and Authentication with a suitable example to elaborate. With the help of a suitable diagram, explain the various Database Security Levels and how Discretionary Access Control in SQL maintains security. Discuss why Availability is an important aspect of secure DBMS and how it can be ensured. [20 Marks, Maximum 600 Words]

References should be provided to any sources of information used - using the Harvard referencing style

**Word count guideline**: 350 – 600 (not including quotations, tables, graphics)

*(Total 25 marks)*

1. ***Data Warehousing & Data Marts***

Discuss what the following terms mean when describing the characteristics of the data in a data warehouse:

* 1. ETL process
  2. Subject-oriented
  3. Integrated
  4. Time-variant
  5. Nonvolatile

References should be provided to any sources of information used - using the Harvard referencing style

**Word count guideline**: 350 – 500 (not including quotations, tables, graphics)

*(Total 25 marks)*

1. ***Non-relational database***

Your employers have mentioned the possibility of adopting and using a Non-Relational Database. Discuss the pros and cons of non-relational databases. Explain your answers with examples. Discuss a range of non-relational databases. After discussing Non-Relational databases make an argument either for or against the use of a Non-Relational database for your employers’ system.

References should be provided to any sources of information used - using the Harvard referencing style

**Word count guideline**: 350 – 500 (not including quotations, tables, graphics)

*(Total 25 marks)*