8. Databases

Starter Quiz · 课前小测

A-Level Computer Science Name: _____ Score: _____

1. Storing a customer's address in several separate files leads to:

   ☐ data redundancy, which can cause inconsistency

   ☐ faster queries

   ☐ automatic backups

   ☐ better security

2. In an E-R diagram, the number of one entity that can relate to one of the other, marked at each end of the line, is the _____.

   _____

3. A data dictionary in a DBMS holds:

   ☐ a description of every table, field, type and key

   ☐ the actual customer records

   ☐ the user's passwords

   ☐ the program source code

4. Which is part of the Data Definition Language (DDL)?

   ☐ CREATE TABLE

   ☐ SELECT

   ☐ UPDATE

   ☐ INSERT

5. In a flat-file system the same data is often duplicated across files, which can become inconsistent when only one copy is updated.

   ☐ True ☐ False

6. Each customer can place many orders, but each order belongs to one customer. This relationship is:

   ☐ one-to-many (1:M)

   ☐ one-to-one (1:1)

   ☐ many-to-many (M:N)

   ☐ no relationship

7. The logical schema of a database describes:

   ☐ the tables, attributes and relationships, independently of how the data is physically stored

   ☐ where each record is stored on the disk

   ☐ the passwords of the users

   ☐ the SQL queries most often run

8. DDL defines the structure (e.g. CREATE TABLE), while DML works with the data inside it (SELECT, INSERT, UPDATE, DELETE).

   ☐ True ☐ False

9. Which are limitations of the file-based approach? Select **all** that apply.

   ☐ the same data is duplicated in several files

   ☐ copies of the data become inconsistent

   ☐ programs depend on the file layout, so a change means rewriting them

   ☐ there are too many tables to join

   Tick every correct option.

10. Which are data-security features of a DBMS? Select **all** that apply.

    ☐ access rights given to individual users or groups

    ☐ backup procedures with a log of changes

    ☐ encryption of the stored data

    ☐ normalising the tables to 3NF

    Tick every correct option.

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Answers · 答案

A-Level Computer Science

1. **data redundancy, which can cause inconsistency**

   The same data held in many places (redundancy) can be updated separately and become inconsistent.

2. **cardinality**

   Cardinality is one or many at each end; crow's-foot notation draws a bar for one and a foot for many.

3. **a description of every table, field, type and key**

   The data dictionary describes the database structure, so programs query it rather than hard-coding the layout.

4. **CREATE TABLE**

   DDL changes the structure (CREATE, ALTER, DROP). SELECT/INSERT/UPDATE/DELETE are DML (working with data).

5. **True**

   That redundancy and the resulting inconsistency is the core problem the relational model solves.

6. **one-to-many (1:M)**

   One customer → many orders, each order → one customer: a one-to-many relationship.

7. **the tables, attributes and relationships, independently of how the data is physically stored**

   The logical design is separate from the physical storage, which is what lets the storage change without the programs noticing.

8. **True**

   Definition vs Manipulation: DDL shapes the tables; DML reads and changes the rows.

9. **the same data is duplicated in several files; copies of the data become inconsistent; programs depend on the file layout, so a change means rewriting them**

   Redundancy, inconsistency and data dependence are the three named limitations. Tables and joins belong to the relational approach that replaces it.

10. **access rights given to individual users or groups; backup procedures with a log of changes; encryption of the stored data**

    Who may access, and recovery after loss, are security. Normalisation is a design step against redundancy.