

1.3 EXCHANGING DATA · 1.3.2

Normalisation to 3NF & referential integrity

1NF, 2NF, 3NF and what each removes, plus **referential integrity**. Spec 1.3.2(c)(e).

01 The three normal forms

1NF No repeating groups; atomic values; a primary key.

2NF 1NF + no **partial** dependencies (on part of a composite key).

3NF 2NF + no **non-key** (transitive) dependencies.

Goal Remove redundancy & anomalies; each fact once.

02 How to normalise

1

→ 1NF

Split repeating groups into separate rows/tables.

2

→ 2NF

Move fields that depend on part of the key to their own table.

3

→ 3NF

Move fields that depend on a non-key field out; leave a foreign key.

03 Referential integrity

Rule A **foreign key** must match an existing **primary key** (or be empty). No orphaned records.

Broken

by Inserting an unmatched foreign key, or deleting a primary-key record still referenced elsewhere.

Enforced

by The DBMS, to keep linked data consistent.

FINAL PASS BEFORE THE EXAM

Rapid exam tips

Seven slips on normalisation questions.

01

1NF: state both rules — no repeating groups **and** atomic values.

02

2NF removes **partial** dependencies (part of a composite key); **3NF** removes **non-key/transitive** ones.

03

A single-field key with atomic values is **already in 2NF** — no partial dependency is possible.

04

"Why not in 3NF?" → find a non-key field that depends on **another non-key field**.

05

Referential integrity = **foreign key matches an existing primary key**; mention **orphaned records**.

06

It breaks when you delete a referenced primary key or insert an unmatched foreign key.

07

Normalisation benefits: less redundancy, fewer anomalies, smaller and more consistent data, easier updates.