Optimizing Database Structures for Efficiency

Part 1: Office Roleplay Dialogue

Scenario: A Database Administrator, Yuki, is discussing database structure design and optimization with his colleague, Rachel, to ensure efficient data storage and retrieval.

Rachel: Hey Yuki, I was reviewing our database design, and I think we need to improve the structure for better performance.

Yuki: I agree. We should check if our **schemas** are properly designed to organize data efficiently.

Rachel: That makes sense. Also, have you considered **normalization**? We might need to break down some large tables to eliminate redundancy.

Yuki: Definitely. Normalizing the database will improve consistency, but we need to balance it with performance needs.

Rachel: Good point. What about **indexes**? If we add the right ones, it could speed up query execution significantly.

Yuki: Yes, I was thinking the same. Properly placed **indexes** can reduce search times, especially for frequently accessed data.

Rachel: And for relationships between tables, are we using **foreign keys** correctly? They help maintain data integrity.

Yuki: Yes, but we should verify that every **foreign key** links correctly to a **primary key** in another table. That prevents orphaned records.

Rachel: Got it. We also need to ensure that the **primary key** selections are optimized for indexing efficiency.

Yuki: Agreed. Let's review all the **schemas** and indexing strategies before finalizing the database structure.

Rachel: Sounds like a plan! I'll gather the performance reports, and we can make the necessary adjustments.

Part 2: Comprehension Questions

1. Why does Yuki suggest reviewing schemas?

(A) To delete unnecessary data

(B) To change the database into a spreadsheet

(C) To ensure the database is well-organized ✅

(D) To add more user accounts

2. How does normalization help in database design?

(A) It eliminates redundancy and improves consistency ✅

(B) It increases database size

(C) It slows down query performance

(D) It removes all indexes from the database

3. Why are foreign keys important?

(A) They increase database storage space

(B) They prevent users from accessing data

(C) They automatically delete duplicate records

(D) They link records between tables to maintain data integrity ✅

4. What is the benefit of using indexes?

(A) They remove old data from tables

(B) They improve query performance by speeding up searches ✅
(C) They increase the size of the database
(D) They prevent unauthorized access to the database

Part 3: Key Vocabulary Definitions in Japanese

1. **Normalization (正規化)** – データの冗長性を減らし、一貫性を保つためにデータベースを整理する手法。
2. **Indexes (インデックス)** – データベースの検索速度を向上させるための仕組み。
3. **Schemas (スキーマ)** – データベースの構造や設計を定義するフレームワーク。
4. **Foreign Key (外部キー)** – 他のテーブルの主キーと関連付けられたフィールドで、データの整合性を維持する役割を持つ。
5. **Primary Key (主キー)** – 各レコードを一意に識別するためのフィールド。

Part 4: Questions & Correct Answers

1. **Why does Yuki suggest reviewing schemas?**
   ✅ (C) To ensure the database is well-organized

2. **How does normalization help in database design?**

   ✅ (A) It eliminates redundancy and improves consistency

3. **Why are foreign keys important?**

   ✅ (D) They link records between tables to maintain data integrity

4. **What is the benefit of using indexes?**

   ✅ (B) They improve query performance by speeding up searches