

SECTION B: Long-Answer Questions – Data and Databases

Question 18 – Data Integrity in a College Database (6 marks)

A college stores student records in a database that includes tables for Students, Courses, and Enrolments. Each student can enrol on multiple courses, and each course can have many students.

Explain how the use of primary keys and foreign keys helps maintain data integrity in this system.

(Total for Question 18 = 6 marks)

Question 19 – Data Types and Storage Decisions (8 marks)

A retail company is creating a new stock management database. The design team must decide which data types to assign to each field.

Discuss how choosing suitable data types for these fields supports accuracy, efficiency, and validation within the database. Provide examples.

(Total for Question 19 = 8 marks)

Question 20 – Relationships Between Tables (9 marks)

A travel agency holds data about customers, bookings, and destinations in separate tables. Each customer can have many bookings, but each booking refers to one destination.

Analyse the advantages of storing this data using a relational model with one-to-many and many-to-one relationships rather than in a single flat file.

(Total for Question 20 = 9 marks)

Question 21 – Data Validation and Referential Integrity (12 marks)

A hospital database contains several related tables: Patient (PatientID, Name, DateOfBirth, Address), Doctor (DoctorID, Name, Department), Appointment (AppointmentID, PatientID, DoctorID, AppointmentDate). The IT department is reviewing the design after reports of missing and duplicate appointment records.

Evaluate how using referential integrity, data validation rules, and appropriate key constraints can prevent data inconsistency and improve the reliability of hospital information systems.

(Total for Question 21 = 12 marks)