



**BOWEN UNIVERSITY IWO, OSUN STATE**

**COLLEGE OF COMPUTING AND COMMUNICATION STUDIES**

**SOFTWARE ENGINEERING PROGRAMME**

**B.SC. DEGREE FIRST SEMESTER EXAMINATION SESSION: 2023/2024**

**COURSE TITLE: DATABASE SYSTEM**

**COURSE CODE: SEN 307 COURSE CREDIT: 3 UNITS TIME ALLOWED: 2 HOURS**

**INSTRUCTION: Answer any 4 questions**

**QUESTION One**

- a. Describe normalization and the following normal forms
  - i. First normal form
  - ii. Second normal form
  - iii. Third normal form10marks
- b. Explain the reason why the student table below is not in the normal form and decompose the table into appropriate normal form 10marks

STUDENT Table

STD_ID	STD_NMAE	STD_PHONE	STD_STATE
BU21SEN1010	John	7272826385 9064738238	Osun
BU21SEN1033	Harry	8574783832	Delta
BU21SEN1123	Tunde	7390372389 8589830302	Lagos

- c. Re-write the following statement in relational Algebra
  - i. List all student with a score greater than 70 from student table
  - ii. Produce a list of salaries for all staff, showing only staffNo, fName, lName, and salary details from staff table5marks

**QUESTION Two**

- a. What do you understand by the followings: 8marks
  - i. Primary key
  - ii. Candidate key
  - iii. Foreign key
  - iv. Super key
- b. Describe five basic operations in relational algebra 10marks
- c. Describe any three data models 7marks

**QUESTION Three**

- a. Describe database constraint and three types of database constraints 10marks
- b. Highlight any five properties of relations 10marks
- c. Describe three-tier Client-Server architecture 5marks

#### **QUESTION Four**

- a. Expatiate on Schemas and Instances of a Database 10marks
- b. Given an Employee Database schema with the following:  
Fname, Lname, SSn, Bdate, Address, Sex, Salary  
Create a typical instance of an employee schema 6marks
- c. Describe various anomalies associated with a relation 9marks

#### **QUESTION Five**

- a. Explain Entity-Relationship ( ER) Model 5marks
- b. Design an ER model for the following:  
Professors, Students, Courses Relationship between entities 5marks
- c. Discuss data model and its levels 15marks

#### **QUESTION Six**

- a. Describe the possible violations for the following operations on constraints:  
INSERT, DELETE, UPDATE 15marks
- b. Expatiate on the following concept of database:
  - i. Functional dependency
  - ii. Trivial Functional Dependency 10marks