



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF COMPUTING
DEPARTMENT OF COMPUTER SCIENCE

2025_1 EXAMINATION

Course Code: CIT844

Course Title: Advanced Database Management System

Credit: 2 units

Time allowed: 2 Hours

Instruction: Answer Questions ONE (1) and any other TWO (2)

QUESTION ONE

- a. Discuss the term Database Design (5 marks)
- b. Itemize the 5 common causes of Backup Recovery failures **(5Marks)**
- c. Explain the categories hardware protection in a database management system. **(6 marks)**
- d. Describe two (2) basic features for transaction recovery **(8 Marks)**
- e. Explain the different methods of backup in a database **(6 marks)**

QUESTION TWO

- a. As a computer scientist in the making, explain to a layman what the Bully Algorithm is in a distributed system. **(8 marks)**
- b. Discuss any three (3) significant features of Database Management Systems (DBMS) **(6 marks)**
- c. Define Serializability **(2 marks)**
- d. Identify the required steps for conceptual design in database design process. **(4 marks)**

QUESTION THREE

- a. Discuss Domain constraints. **(5 marks)**
- b. The Scheduler is a module that is responsible for implementing a particular strategy for concurrency control. List at least three (3) of the modules. **(6 Marks)**
- c. Why is Database Design important? **(4 marks)**
- d. Write a short on Election Algorithms **(5 Marks)**

QUESTION FOUR

- a. Explain the specific phases involved Optimistic Concurrency Control (OCC) transactions. **(8 Marks)**
- b. Highlight the basic features of Logical Data Model **(5 Marks)**
- c. What is Backup Coordinator in Database **(3 Marks)**
- d. Define the following;
 - (i) Entity **(1 mark)**
 - (ii) Attributes **(1 mark)**
 - (iii) Relationship **(1 mark)**
 - (iv) Foreign Key **(1 mark)**

QUESTION FIVE

- a. Describe data model verification step **(4 Marks)**
- b. Before creating the ER model, the designer must communicate and enforce appropriate standards to be used in the documentation of the design. Highlight the process involved in defining business rules and developing the conceptual model using ER diagrams. **(7 marks)**
- c. List 3 steps of Query Optimization and explain them **(6 Marks)**
- d. Explain the examples of transaction serializability in database system **(3 Marks)**