



**UGANDA INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
PROGRESSIVE ASSESSMENT EXAMINATIONS
ACADEMIC YEAR 2025/2026**

PROGRAMME(S): DIPLOMA IN INFORMATION TECHNOLOGY FOR BUSINESS (DITB)
DIPLOMA IN COMPUTER SCIENCE (DCS)

YEAR OF STUDY: ONE SEMESTER TWO

COURSE: DATABASE SYSTEMS DESIGN I

COURSE CODE : CSC1203

DATE: SUNDAY 28TH, JUNE 2026

TIME: 9:00 AM – 12:00 PM

DURATION: 3 HOURS

VENUE: TENT A, TENT B

Instructions:

1. This exam is composed of two sections; Section A and B
2. Section A takes 40 Marks and its compulsory and Section B takes 60 marks
3. Choose any three questions in Question B. Each Question carries 20 Marks (Equal Marks)

SECTION A

1. A company stores customer information in separate Excel files in different departments. What is the major disadvantage of this approach?
 - A. Improved security
 - B. Reduced storage requirements
 - C. Data inconsistency
 - D. Faster report generation
2. Which of the following is **NOT** a limitation of a file-based system?
 - A. Data redundancy
 - B. Data inconsistency
 - C. Data independence
 - D. Difficult data sharing
3. Which DBMS feature ensures that all departments access the same updated customer information?
 - A. Data duplication
 - B. Centralized database
 - C. Flat files
 - D. Spreadsheet linking
4. Which advantage is gained by migrating from a file-based system to a DBMS?
 - A. Increased data redundancy
 - B. Improved data integrity
 - C. More duplicate files
 - D. Reduced data security
5. Which level of the three-level architecture is concerned with how data is physically stored?
 - A. External Level

- B. Conceptual Level
 - C. Internal Level
 - D. User Level
6. Students viewing only their examination results is an example of which level?
- A. Internal Level
 - B. External Level
 - C. Physical Level
 - D. Storage Level
7. The conceptual level mainly describes:
- A. Physical storage devices
 - B. User interfaces
 - C. Overall logical structure of the database
 - D. Network configuration
8. Which data model focuses on business requirements without considering implementation?
- A. Physical Model
 - B. Conceptual Model
 - C. Relational Model
 - D. Hierarchical Model
9. Which model identifies tables, primary keys and relationships?
- A. Physical Model
 - B. Conceptual Model
 - C. Logical Model
 - D. File Model
10. Which model specifies indexes and storage methods?

- A. Conceptual Model
 - B. Logical Model
 - C. Physical Model
 - D. External Model
11. In an ERD, a real-world object represented in the database is called a:
- A. Attribute
 - B. Relationship
 - C. Entity
 - D. Tuple
12. Which symbol usually represents an entity in an ERD?
- A. Diamond
 - B. Rectangle
 - C. Oval
 - D. Triangle
13. A professor teaching many students while students have many professors is an example of:
- A. One-to-One
 - B. One-to-Many
 - C. Many-to-Many
 - D. Recursive
14. Which of the following describes an attribute?
- A. Student
 - B. Department
 - C. Student Name
 - D. Enrols

15. Changing a coordinator's phone number in only one record while others remain unchanged causes:

- A. Insertion anomaly
- B. Update anomaly
- C. Deletion anomaly
- D. Functional dependency

16. Which anomaly occurs when you cannot add a programme because no student has enrolled yet?

- A. Deletion anomaly
- B. Insertion anomaly
- C. Update anomaly
- D. Retrieval anomaly

17. Which database technique best minimizes redundancy?

- A. Duplication
- B. Normalization
- C. Compression
- D. Indexing

18. Which SQL statement creates a new database?

- A. NEW DATABASE
- B. CREATE DATABASE
- C. MAKE DATABASE
- D. ADD DATABASE

19. Which SQL command displays all records in the Employees table?

- A. DISPLAY * FROM Employees;
- B. SHOW Employees;

C. SELECT * FROM Employees;

D. VIEW Employees;

20. Which SQL clause filters rows returned by a query?

A. ORDER BY

B. WHERE

C. GROUP BY

D. HAVING

SECTION B (60 marks)

Choose 3 questions from this section

Question 21

A large wholesale distributor in down-town Kampala currently relies on a collection of separate computer programs developed in different departments. The Sales department manages its records using Microsoft Excel, while the logistics department runs an independent system utilizing custom flat text files. Customers are increasingly complaining that invoices mailed by sales department contain outdated delivery addresses, even after they have formally registered updates with logistics.

(a) Identify and explain five (5) distinct limitations of file-based systems that this scenario demonstrates. (10 Marks)

(b) Discuss how migrating to a central Database Management System (DBMS) would resolve issues that usually come with the above data management approach. (10 Marks)

Question 22

A university is replacing its manual student records system with a Database Management System (DBMS). Different users need different views of the database:

- Students should only view their personal details and examination results.
- Lecturers should view student names, course units, and marks for the courses they teach.
- The Database Administrator (DBA) should manage the entire database, including how data is physically stored on the server.

The university has decided to implement the three-level DBMS architecture (ANSI/SPARC architecture).

Required:

a) Identify and briefly explain the three levels of the DBMS architecture. (6 Marks)

b) Using the scenario above, give one example of how each level is applied in the university database system. (3 Marks)

c) State one benefit of using the three-level DBMS architecture in this system. (1 Mark)

(d) A regional hospital wants to replace its legacy medical record management software. The IT board has hired you as a Database Design specialist to enlighten them about a modern Relational Data Model.

Required:

- (i) Differentiate between a Conceptual Data Model, a Logical Data Model, and a Physical Data Model. For each model type, name one specific artifact or piece of information that a database designer would produce. (10 Marks)

Question 23

There are several departments in School of Business and Public Administration at MUBS. Each department belongs to one school. A department has many professors, but a professor may belong to more than one department. Similarly, courses may be offered by several departments and a department must have at least one course. A professor may teach more than one student, and a student may have more than one professor.

Required:

- (i) Identify all major entities involved, their attributes and relationships among them (10 marks)
- (ii) Draw an Entity Relationship Diagram (ERD) to represent the above scenario. Indicate the necessary multiplicities where necessary (10 marks)

Question 24

Bright Future Institute stores student fee payment records in a single spreadsheet as shown below.

Student_ID	Student_Name	Programme	Course_Coordinator	Coordinator_Contact	Fee_Paid
S001	Alice	Diploma in IT	Mr. Kato	070123 4567	500,000
S002	Brian	Diploma in IT	Mr. Kato	070123 4567	650,000
S003	Carol	Diploma in Business	Ms. Amina	078765 4321	700,000
S004	David	Diploma in IT	Mr. Kato	070123 4567	450,000

The college management has noticed that the programme coordinator's details are repeated for every student enrolled in the same programme. They are concerned that this may cause problems when updating or managing the data.

Required:

- a) Define the term data redundancy. (2 Marks)
- b) Using the scenario above, identify two examples of data redundancy. (4 Marks)
- c) Explain the following update anomalies using the scenario:
- i) Update anomaly (4 Marks)
 - ii) Insertion anomaly (4 Marks)

iii) Deletion anomaly

(4 Marks)

d) How can the institute resolve the above issues?

(2 Marks)

Question 25

HK ICT solution received applications for various jobs and want to keep the Employee's information in a database. Table.2 shows the Employee's table.

Table.2: Employees

IDNo	F_Name	L_Name	Gender	Age	Position
C01	Katono	Mari	female	43	Technician
C02	Hilda	Bahati	female	66	Receptionist
C03	Adriko	Vincent	male	54	Askari
C04	Luutu	Wash	male	78	Askari
C05	Lubuga	Muni	male	99	Chef

Required:

Write an SQL statement to;

(a) Create a Database called "Jobs". (02 marks)

(b) Create the "Employees" Table with the required fields and appropriate data types. (04 marks)

(c) Show Table Structure of Table created in 3(b) above. (03 marks)

(d) Populate the Employees Table with information as shown above. (04 marks)

(e) Create a list of all Employees. (02 marks)

(f) Display those Employees who applied for the Askari job. (03 marks)

(g) Select all the Employees whose "F_name" begins with letter "L". (02 marks)

END