TEVETA

ADVANCED CERTIFICATE IN COMPUTER STUDIES

LEVEL 5 EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATION

NOVEMBER/DECEMBER **2021**

SUBJECT: DATABASE TECHNOLOGY

TIME ALLOWED 3 HOURS   TOTAL MARKS: 100

PASS MARK 50

INSTRUCTIONS TO CANDIDATES:

QUESTION 1

(a) A database is a shared collection of logically related data and its description
Describe the meaning of the

    i.   **Shared collection**   **(3 marks)**

    ii.   **Logically related**   **(3 marks)**

    iii.   **Its description**   **(3 marks)**

(b) Explain the importance of concurrency in database systems   **(5marks)**

(c) Distinguish between logical data independence and physical data independence.   **(6 marks)**

QUESTION 2

    (a) Define a transaction   **(2 marks)**

    (b) Outline the properties of a transaction   **(12 marks)**

    (c) Distinguish between database Intension and Extension (6 marks)

QUESTION 3

Consider the database schema below

Employee (EmployeeNo, FName, LName, DateEng, DOB, Gender, Salary)

Department (DeptId, DeptName, DeptHeadNo)

Project (ProjectId, ProjectName, ProjectLocation, DeptNum, projectmgr)

Write SQL statements to carry out the following:

    (a) Retrieve EmployeeId, Full Name (FName and LName), Salary of all employees from automotive department.   **(5 marks)**

    (b) Increase the Salary of project managers by 25%   **(5 marks)**

    (c) For all projects located in Mansa, Retrieve the Id, First Name, Last Name and date of engagement of the project manager.   **(10 marks)**

QUESTION 4

    (a) Distinguish Relational algebra from relational calculus   **(5 marks)**

    (b) Explain the relational algebra operators   **(10 marks)**

    (c) Consider the relation below:

        Staff (EmployeeNum, fname, lname, position, gender, salary)

Write relational algebra expression for

    i.   List all employees whose salary is greater than 3500   **(3 marks)**

    ii.   Produce a list of all employees showing First name, Last name, position and Gender

                                  (3 marks)

QUESTION 5

Describe the stages of database design
(20 marks)

QUESTION 6

(a) Explain the security process provided by the view tool in the database   **(4 marks)**

(b) **Outline the database recovery techniques**   **(12 marks)**

(c) **Explain the four(4) advantages of the DDBMS**   **(4 marks)**

QUESTION 7

(a) A data warehouse is a subject -oriented, integrated, time variant, and non-volatile collection of data in support of management's decision-making process

    Discuss two (2) advantages of data warehousing   **(8 marks)**

(b) Describe the normalization process up to the third normal form   **(12 marks)**