



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE (STATISTICS AND PROGRAMMING)**

SST 203: DATABASE SYSTEMS

DATE: Wednesday, 4th April, 2012

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS:

Answer question **ONE** and any other **TWO** questions.

Question 1

- a) Define the term database (2 marks)
- b) Briefly explain three limitations of a file system (3 marks)
- c) Assume you have been assigned the duty in your working organization to assist them in accessing the most suitable DBMS for their administration. Describe five factors you could consider important when assessing the suitability of the DBMS. (10 marks)
- d) Give three reasons, which might make you not use, as a DBMS when designing a system. (3 marks)
- e) A CUSTOMER ORDER has the following details:
Customer Name, Customer No, Order No, Product No, Product Description, Quantity, Customer Address, Date Ordered.
Normalize the data into 1NF, 2NF and 3NF, indicating what is required for each level and any assumption that you may use. (12 marks)

Question 2

- a) Explain what conceptual database design involves (6 marks)
- b) Differentiate between logical and physical data independence (4 marks)
- c) Consider the case below for a company:

A company has several departments each department has a supervisor and at least one employee. Employee must be assigned to at least one, but possible more departments. At least one employee is assigned to a project, but an employee may be on vacation and not assigned to any projects. The important data fields are the names of the employees, as well as the supervisor and employee number and unique project number. Develop and draw a fully attributed ERD (10 marks)

Question 3

- a) Name three DML commands and state their function (3 marks)
- b) What is an SQL view? Describe three advantages of using a view in database design (5 marks)
- c) Consider the following two tables

EMPLOYEES (Employee No, Name, Department No,
Designation, Address, Salary)

DEPARTMENT (Department No, Name, Location)

Write an SQL statement, which will

- i) List all the employees whose name start with character m (2 marks)
- ii) List the name of the highest paid employee (2 marks)
- iii) List the names of employees in department no = 30, in ascending order of salary (2 marks)
- iv) List each department and all employees that work there. Show the department and location even if no employees work there (3 marks)
- v) List the names and salaries of employees in department no 15, who have the same designation as employees in department no 18 (3 marks)

Question 4

- a) What is the meaning of the term transaction? Explain three properties of a transaction (5 marks)
- b) What is concurrency control? Describe in details one potential problem caused by concurrency (5 marks)
- c) Describe five major RDBMS integrity features (5 marks)
- d) Describe five techniques commonly used for database recovery (5 marks)

Question 5

- a) Give five advantages which could make client-server architecture to be preferred than file-server architecture (5 marks)
- b) In the context of database security differentiate the terms data integrity and system integrity (3 marks)
- c) Explain five consequences that an organization can face as result of breach of database security (10 marks)
- d) Define the term distributed databases (2 marks)

