JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

2ND YEAR 1ST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF EDUCATION (ARTS & SCIENCE), BUSINESS ADMINISTRATION WITH IT

MAIN – RESIT

COURSE CODE: **SCS 212**

COURSE TITLE: **DATABASE SYSTEMS**

EXAM VENUE: **STREAM: (BBA, Bed Arts & Sci.)**

DATE: 06/05/2016 **EXAM SESSION: 2.00 – 4.00 PM**

TIME: 2.00 HOURS

INSTRUCTIONS:

1. **Answer ALL question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

QUESTION ONE **[30 MARKS]**

(a) What is a *database management system*? How does it differ from *database system*? [4 Marks]

(b) Give any two disadvantages of database systems over file-based systems. [2 Marks]

(c) Name the tasks of any FOUR types of database administrators you know. [4 Marks]

(d) Explain how GROUP BY clause works. [2 Marks]

(e) Differentiate between *Conceptual Model* and *Logical Model* in database design? []

(f) Use the relation schema below to demonstrate the use of UPDATE statement.

PRODUCT (PartNo, PartName, Price) [4 Marks]

(g) Explain *relational algebra* as applies to database system. Give an equivalent relational algebra for the query "*List all students that do not take SCS 212*". [4 Marks]

(h) Identify any THREE principles features of database software. [3 Marks]

(i) Define the term *normalization* as applies to database design? Distinguish between *First Normal Forms* and *Second Normal Forms*. [5 Marks]

(j) "A distributed database system allows applications to access data from local and remote databases". Explain in support of the statement. [2 Marks]

QUESTION TWO **[20 MARKS]**

(a) Name any three data types used in relational database management systems. [3 Marks]

(b) Using examples from the relation schema **STUDENT (SID, SNAME, GENDER, AGE)** to explain the two Structure Query Language (SQL) aspects: Data Definition Language (DDL) and Data Manipulation Language (DML). [8 Marks]

(c) The database descriptions consist of a schema at each of the three levels of abstraction: the *conceptual*, *physical*, and *external* schemas. Discuss. [9 Marks]

QUESTION THREE **[20 MARKS]**

(a) What is your understanding *integrity constraint*? Explain the FOUR types of integrity constraints. [6 Marks]

(b) Wachezo Limited has a large collection of data on employees, departments, products, sales etc. This database is accessed concurrently by several employees. Briefly explain the type of database system that is suitable for this company. [4 Marks]

(c) Below are two relation schemas. Study and use them to answer questions that follow.

EMPLOYEE (EMPID, EMPNAME, SALARY, DEPT*)

DEPARTMENT (DEPTID, DEPTNAME, BUILDING, DEPTMGR)

Give SQL statements for the following queries

(i) List of all employees working in HR department and earn more than KES 10,000. [6 Marks]

(ii) List of department managers earning less than KES 55,000. [4 Marks]

QUESTION FOUR **[20 MARKS]**

(a) Differentiate between the following terms as applies to databases [8 Marks]

(i) Relation Schema and Relation Instance

(ii) Multivalued Attribute and Composite Attribute

(iii) Composite Key and Candidate Key

(iv) Binary and Ternary Relationships

(b) Using a suitable diagram, explain the structure of database management system (DBMS. [6 Marks]

(c) Draw an Entity-Relationship (ER) diagram based on the description below. [6 Marks]

A university consists of a number of departments. Each department offers several courses. A number of modules make up each course. Students enroll in a particular course and take modules towards the completion of that course. Each module is taught by a lecturer from the appropriate department, and each lecturer tutors a group of students

QUESTION FIVE **[20 MARKS]**

(a) Name and explain the two levels of data independence. [4 Marks]

(b) Distinguish between Data Warehouse and Data Mart. [4 Marks]

(c) Give FOUR non-technical factors to be considered when choosing database software for a company. [4 Marks]

(d) Explain the significance of following to database management system [4 Marks]

(i) Data Repository (iii) Data Backup

(ii) Triggers (iv) Views

(e) Name and explain any two database objects you know. [4 Marks]