**University examinations 2013/2014**

Fourth year second semester examination for the degree in bachelor of computer science

Ics 2415-advanced database systems

**Date: april 2014** **time: 2 hours**

**Instructions:** *Answer question one and any other two questions*

**Question one-30 marks**

1. Discuss any four challenges encountered in development of commercial databse. Briefly outline how most of the challenges can be tackled
2. Study the following scenario and answer questions that follow the department of mathematics and computer science of bidii college has a set of courses provided ffor the undergraduate level. Ffor each of course a well defined set of admission criteria is specified; for instance, for the ‘’computer science’coursee, 3 A-levels are required, minimum B for each, an A-level in Mathematics being compulsory. Each course has a name and duration; certain courses can allow industrial placements. Each course consists of a set of modules, some compulsory and some optional. A certain module is described by tits name, a short syllabus, type(lectured, seminar-like, project)and year of study for which it was intended. Each student enrolled with the department, is registered for one particular course. The student must attend the compulsory modules. For every year of study, from the set of optional modules, the student must attend a certain number which is specified in the course’”s description. Each module is taught by a single lecturer. However, there might be modules, from the optional ones, that are taught by a single lecturer.however, there might be modules, from the optional ones, that are not taught at all(for instance, because no students have actually registered for them). There also can exist lecturers who do not teach at all, being only involved in research. Contact information( address, telephone,...) plus personal details( date of birth, male/female...)is neede ffor both lecturers and students. i. Develop an ER diagram for the college ii. write SQL statement to create course table iii. write SQL command to display all student courses and will proceed for industrial attachment iv.suppose various courses are offered at different campuses.discuss how data will be \*distributed \*secured

**Question two-20 marks**

1. Define the relational model. What is a relational database management system?
2. Explain the two types of program-data independence on the basis of the three levels ANSI/SPARC architecture of a database.
3. Describe one of the possible problems generated by concurrent access to the same data(the lost update problem, the uncommitted dependency problem, the inconsistent analysis problem) and illustrates how the problem can be resolved by using the locking mechanism
4. Differentiate between data warehousing and data mining

**Question three-20 marks**

1. List advantages of oriented database as compared to relational databases.
2. What is OLAP? Who uses OLAP?
3. A well established bank iin Kenya wishes to migrate to a distributed database. As anexpert in databases explain to the institution aspect of distributed database using the following format: i.Advantages and disadvantages of distributed databases ii. How to distribute and secure rhe database iii. Software and hardware requirements for a distributed database

**Question four-20 marks**

1. Discuss any four mechanisms for ensuring cntinous availability of distributed database in an insecure multi user environment (8 marks)
2. Using the narrative in question 1(b)above design a relational dataase for BIDII COLLGE (12 marks)

**Question five-20 marks**

1. Briefly outline main role of database administrator (4 marks)
2. Discuss any two tools used by database administrator to perform above roles` (4 marks)
3. Using the narrative in question 1(b) above design an object oriented database for BIDII COLLEGE (12 marks)