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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

 **UNIVERSITY EXAMINATIONS 2017/2018**

**YEAR II SEMESTER I EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY**

**ICS 2206: DATABASE SYSTEMS**

**DATE: FEBRUARY 2018 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

1. What is DBMS? [4 marks]
2. Write the SQL command that create two relations, student and course. Where by student (sID,f Name, l Name, age, cID, RegDate) and Course (cID, (Name, units). Make sure that your statement specifies any primary key and Foreign keys. You should enforce the constraint that student age should be greater than zero. [8 marks]
3. Show how the following components are represented in ER – Model;
* Weak entity relationship
* Multivalued attribute
* Derived attribute
* Composite attribute [8 marks]
1. Consider the following scenario: A University registrar’s office maintains data about the following entities; course, including number, title, credits, syllabus and prerequisites; course offerings including course number, year, semester, section number; instructor timings, and classrooms; students, including student Id, name and program; instructors, including identification number, name, department and title. The instructor is allowed to teach only the courses that are offered by the University. Furthermore, the enrolment of students in courses and grades awarded to students in each course they are enrolled all must be appropriately modeled.

Construct an ER diagram from the registrar’s office for the given scenario. Document all the assumptions that you make about mapping constraints. [10 marks]

**QUESTION TWO (20 MARKS)**

1. Describe two levels of data independence. [6 marks]
2. Differentiate between DDL and DML. Give at least two examples of the commands in each language. [8 marks]
3. Consider the following relational schema;

EMP (SSN, Name, MGR – SSN, Salary, Dno)

Dept (Dno, Dname, Mgrssn)

Write the following SQL queries based on the given schema above;

1. Display the names of employees in the ascending order of their salaries.
2. Retrieve the names of the employees working in ‘IT’ department. [6 marks]

**QUESTION THREE (20 MARKS)**

1. What is an Entity Relationship Model? [3 marks]
2. Differentiate between weak entity and strong entity set in entity relationship model. [4 marks]
3. Design a relational database schema corresponding to the following ER diagram. [13 marks]

**QUESTION FOUR (20 MARKS)**

1. What is Key Constraint? [2 marks]
2. Discuss THREE types of key constraints in relational model. [6 marks]
3. Consider the following Schema STUDENTS (Student-Code,fname, Lname, email, phone-no, date-of-birth, honors-subject, markes) [2 marks each]

Write the SQL commands based on this Schema to:

1. Display the full name of students into the column title “Name”
2. Display the unique honors subject from the schema
3. Display all the students names with honors-subject ‘Eng01’
4. Display all the students whose first names starts with the character ‘A’
5. Display all the students, whose the second letter in the first name is ‘*i*’
6. Display names of all students in descending order of percentage of marks.

**QUESTION FIVE (20 MARKS)**

1. Discuss the use of DCL [3 marks]
2. What is the purpose of grant and revoke commands? Give the syntax for each statement. [8 marks]
3. Write the statement that creates the user named “Sales Dept” with the password of “sales”. Provide them with the permission to select, update and delete data from the table “Order” which is inside the XYZ database. Revoke the delete permission from the same table to the users you have created. [9 marks]