**NNAMDI AZIKIWE UNIVERSITY AWKA**

**DEPARTMENT OF ELECTRONIC AND COMPUTER ENGINEERING**

**SECOND SEMESTER 2013/2014 REGULAR EXAMINATION**

**ECE 542: Database Management System**

***Instruction:*** *Answer 2 Questions only (question 1 and any other)*

**SECTION B**

Question 1.

1. Explain in clear terms the three levels of abstraction in DBMS design. Use appropriate examples where necessary.
2. What is the major difference between primary key constraint and foreign key constraint? Give appropriate example.
3. How many distinct arity and tuples are in a relation instance with cardinality of 22 and degree of 6?
4. Does the relational model, as seen by an SQL query writer, provide physical and logical data independence? Explain.

Question 2.

You were asked to supervise the digitization of data in a company. Information that needed to be extracted from the archives and digitized include

* Information about employees (identified by ssn, with salary and phone as attributes);
* Departments (identified by dno, with dname and budget as attributes);
* Children of employees (with name and age as attributes).

Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.

1. Create a conceptual schema for the above scenario.
2. Draw an ER diagram(s) that captures this information.
3. Write SQL statements to create the corresponding relations and capture as many of the constraints as possible. If you cannot capture some constraints, explain why.

Question 3.

Consider the following information about a hospital database:

Doctors have registration no (rno), address, phone and rank. Patients have card no (cno), address, phone and contact date.

Doctors attend to patients; each patient is assigned to not more than one doctor; each contact date must be recorded

1. Create a conceptual schema for the above scenario.
2. Draw an ER diagram(s) that captures this information. Use only the basic ER model, that is, entities, relationships, and attributes. Be sure to indicate any key and participation constraints.
3. Write SQL statements to create the corresponding relations and capture as many of the constraints as possible. If you cannot capture some constraints, explain why.