KABARAK **UNIVERSITY**

EXAMINATIONS

2008/2009 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: **COMP 314**

COURSE TITLE: **DATABASE MANAGEMENT SYSTEM**

STREAM: **SESSION IV**

DAY: **WEDNESDAY**

TIME: **2.00-4.00 P.M.**

DATE: **26/11/2008**

INSTRUCTIONS:

Answer **Question 1** and **ANY OTHER TWO** questions.

PLEASE TURN OVER

Question One (30 marks)

a. Explain the meaning of these terms

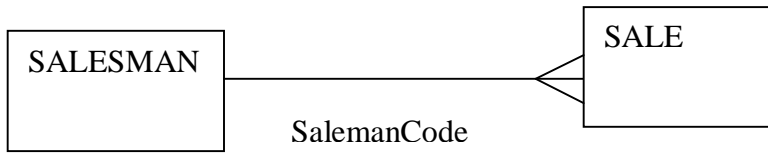   i. Database   2mks

    ii. DBMS   **1mks.**

b. State four database models   **4mks.**

c. What are the advantages of using a DBMS in storing data   **5mks**

d. Explain giving an example, what is meant by logical data independence   **4mks**

e. Explain three controls against database security.   **3mks.**

f. Give the five basic operations of relational algebra and show the sign for each.   **5mks**

g. what is a weak entity? Give an example?   **3mks**

h. Explain the different levels of data abstraction   **3mks.**

Question Two (20mks)

a. Explain the following terms in the context of the relational data model

    i. Relation   1mk

    ii. Attribute   1mk

    iii. Cardinality   1mk

    iv. Tuple   **1mks**

b. The amount of sales by each salesman in each day was kept in a database that contained two tables that were created using the following SQL commands:

    CREATE TABLE Salesman(SalesmanCode CHAR(10) PRIMARY KEY, Name CHAR(20) NOT NULL, IdNo CHAR(10) UNIQUE, Contacts CHAR(20) NOT NULL);

    CREATE TABLE Sale (SaleCode CHAR(10) PRIMARY KEY, SaleDate DATE NOT NULL, SalesmanCode CHAR(10) NOT NULL, Amount NUMBER(10), CONSTRAINT ConForKey FOREIGN KEY (SalesmanCode)REFERENCES Salesman(SalesmanCode)) ;

```
                                          ┌──────────┐
 ┌──────────────┐                         │  SALE    │
 │  SALESMAN    │─────────────────────◁───│          │
 │              │       SalemanCode       │          │
 └──────────────┘                         └──────────┘
```

A student drew the following tables to represent all the records from the database

Salesman

SalesmanCode	Name	IdNo	Contacts
17	Davison Arori	54699877	0722322222
57	Brian Kiptoo	76666554	0735221364
35	Rael Kiyai	54699877	0724369639

Sales

SalesCode	SaleDate	SalesManCode	Amount
1	2/2/05	17	1200
2	2/2/05	23	10000
3	3/2/05	57	
4	4/4/05	17	Notpaid

i). Does the above data satisfy the relational integrity rules?

 If not which of those rules are violated and how?   **4mks.**

ii). what would be the results of the following expression if it was used to retrieve data from the above tables.

$$\sigma_{Amount>1100}(Sales)$$ 2mks

c. The following table forms part of a database held in a relational DBMS.

     Hotel (hotelNo,hotelName,city)

     Room(roomNo,HotelNo,type,price)

     Booking(hotelNo,guestNo,dateFrom,dateTo,roomNo)

     Guest(guestNo,guestName,guestAddress)

The underlined attributes forms the primary key for the tables.

    i.   Identify the foreign keys in this schema.   **2mks**

    ii.   Explain how the entity and referential integrity apply to these relations. **4mks**

    iii.   Describe the relations that would describe the following relational algebra operations

        1. $\Pi_{hotelNo}(\sigma_{price>50}(Room))$

        2. $\sigma_{Hotel.hotelNo=Room.hotelNo}(Hotel \; X \; Room)$ 4mks

Question Three. (20mks)

A foundation dealing with regulation of publication of books maintains a database consisting of three related tables whose structure is as shown below

BOOK (bookCode,bookTitle,authorCode,pubCode,dateOfPub)

AUTHOR(authorCode, authorName, authorCountry, authorContacts)

PUBLISHER(pubCode, pubName, pubCountry, pubContacts)

   N:B. Assume that a book is written by one author and is from one publisher.

    An author may write many books. A publishes many books.

a. Draw an appropriate ERD for the above schema.   **5mks**

b. write down an SQL Statement to:

    i). Change the contacts of the publisher whose code is 'pub12' to 12299   **1mk**

    ii).Insert a record into the authors table (use appropriate values)   **1mk**

    iii).List the total number of books   **1mk**

    iv).Display the titles of all books authored by 'Joseph Paul'   **2mks**

v).Display the name of the author of the of the book titled 'Database Management'   **2mks**

vi). Display the titles of all books as well as the names of their authors and the names of their publishers, recently published books should appear first   **2mks**

vii) Display the titles of all books as well as the names of their authors. Ensure that books of the same author are listed together in a group.   **3mks**

viii)List the names of the publishers who have ever published books authored by 'CJ Date'   **3mks**

Question Four. (20mks)

a. What is data warehousing?   **2mks**

b. Discuss at least four benefits of data ware housing   **8mks**

c. Explain at least three examples of data mining applications   **6mks**

d. What is normalization?   **1mk.**

e. State Three characteristics of suitable set of relations that can be achieved through normalization   **3mks**

Question Five. (20mks)

a. Give and explain any three characteristics of data in a data ware house   **6mks**

b. In what ways can normalization be used to support database design   **4mks**

c. Discuss the different levels of normalization   **4mks**

d. Normalize the table below up to 3rd Normal Form .

<u>Student Number</u>
Student Name
Course Code
Course Title
Module Code
Module Title
No. of Credits
Grade Point
Result Code
Result

6mks