CROSS RIVER UNIVERSITY OF TECHNOLOGY (CRUTECH)
CALABAR

DEPARTMENT OF COMPUTER SCIENCE

First Semester Examination for 2017/2018 Session.

Course Code: CSC 3107

Course Title: Database Design and Management **Time: 2hrs**

Instructions: Answer any Four (4) questions of your choice. All questions carry equal marks.

Question One

(a) Define the term DBMS and high light ten (10) objectives of a Database System
(b) What is a Database Schema? With the aid of a diagram describe the two categories of a database Schema
(c) Explain with examples the various SQL commands in DML.

Question Two

Consider the following relation:

Branch	Customer	Account
Downtown	Smith	2.37
Downtown	Jones	222
Mianus	Smith	250
Downtown	Turner	300
Mianus	Jackson	200
Mianus	Hayes	382
Downtown	Williams	180
Brighton	Jackson	290

Suppose that a branch with all its customer and accounts shall be stored in a variable length record. Show the file organization for the following methods:

(a) Fixed-length representation with reserved space
(b) Fixed-length representation with pointer
(c) Slotted page structure

Question Three

Considering the following relation:

Articles (ID, title, journal, issue, year, start page, end page, TR-ID)

It contains information on articles published in scientific journals. Each article has a unique ID, a title, and information on where to find it (name of journal, what issue, and on which pages). Also, if results of an article previously appeared in a "technical report" (TR), the ID of this technical report can be specified. We have the following information on the attributes:

- For each journal, an issue with a given number is published in a single year.
- The end page of an article is never smaller than the start page.
- There is never (part of) more than one article on a single page.

The following is an instance of the relation:

ID	Title	Journal	Issue	Year	Start page	End page	TR-ID
42	Cuckoo Hashing	JAIg	51	2004	121	133	87
33	Deterministic Dictionaries	JAIg	41	2001	69	85	62
33	Deterministic Dictionaries	JAIg	41	2001	69	85	56
39	Dictionaries in less space	SICOMP	31	2001	111	133	47
57	P vs NP resolved	JACM	51	2008	1	3	99
77	What Gödel missed	SICOMP	51	2008	1	5	98
78	What Gödel missed	Nature	2222	2008	22	22	98

(a) Write an SQL query that returns for each article, its ID, title and the number of authors
(b) Write an SQL query that returns the number of co-authors of 'Robert Tarjan'. (i.e., the number of author who have written at least one article together with him.)

(c) Draw an E/R diagram for the data set described above. Make sure to indicate all cardinality constraints specified above

Question Four

(a) What does a conceptual design of a Database entail?
(b) Describe the three-schema architecture for database management systems and explain how it supports different forms of data independence
(c) Explain the steps involve in Query Processing

Question Five

(a) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents.
(b) Construct appropriate tables for the above (5.a) ER Diagram?
(c) Write a valid SQL statement that would produce a result set like the following:

Name	Name	Date	Amount
Tim	Radish	2005-07-16	23
Tim	Carrot	2005-08-18	28
Tim	Corn	2005-08-28	18

(3 rows)

Question Six

(a) With the aid of a diagram discuss the various Rights and Permission of a Database User
(b) What is meant by the term data independence in the context of relational database?
(c) Explain how SQL does not support the full relational model

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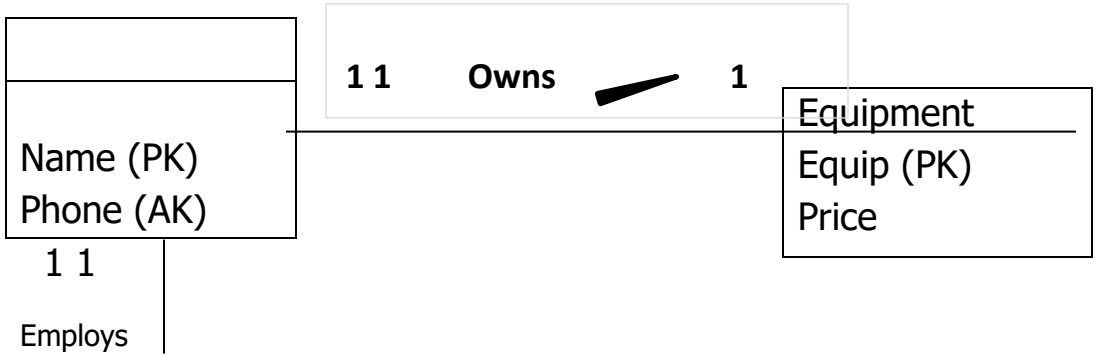
Instructions: Answer any Four (4) questions of your choice. All questions carry equal marks.

Question One

(a) Discuss the reasons for the three-level architecture (external, conceptual and internal) for a Database Management System.

(b) From an SQL user's perspective, does the relational mode provide logical and physical data independence?

(c) Provide a set of relational tables for the high-level data model shown below. Identify primary, alternate, and foreign keys in the tables.



Question Two

a. What are Database Model? Using a Diagram explain the three database user privileges

b. Consider the following schema (the data type of each attribute is given following the attribute names and the primary keys are underlined).

Suppliers (sid: integer, sname, string, address: string)

Parts (pid: integer, paname: string, color: string)

Catalog (sid: integer, pid: integer, cost, real)

The Catalog relation lists the prices charged for parts by suppliers. Write the following queries in SQL

i. **List the pnames of parts for which there is some supplier**
ii. **Find the sids of suppliers who supply a red part or a green part**
iii. **Find the sids of supplier who charge more for some part than the average cost of that part (averaged over all the suppliers who supply that part).**

c) With the aid of a diagram and it Algorithm show the ER specialization or generalization as it comes in the form of hierarchical entity sets.

Question Three

(a) Mention the four main SQL DML commands and their syntax

(b) With the aid of a Diagram define a Database Schema and Explain its components

(c) Write a valid SQL statement that would produce a result set like the following.

Name	Name	Date	Amount
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Tim	Carrot	2005-08-18	28
Tim	Corn	2005-08-28	18

Question Four

Consider the following relation:

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FIRST SEMESTER EXAMINATION FOR 2012/2013 SESSION.

COURSE CODE: CSC 3107

COURSE TITLE: DATABASE DESIGN AND MANAGEMENT **TIME: 2HRS**

INSTRUCTIONS: ATTEMPT ANY FOUR QUESTIONS

DATE: 2013-04-22

Question 1

a) (i) What do you consider to be the relevance of database to an organization?

(ii) Define Database and database management system

(b) (i) Briefly discuss the importance of the entity relationship diagram in database

c) Highlight the types of relationship in database

Question 2

a) What is three Schema architecture of a database?
b) Account for the characteristics of databases
c) (i) Account for the steps in designing a label in database (ii) Explain the relationship between attribute entity
d) Explain the relationship between the fields and records as implemented in database

Question 3

(a) How is MS-Access 2003/2007 launched?
(b) Suppose the Examination officers of 100, 200, 300 and 400 levels of computer Science wants to assess the students' wise performance of each level respectively. On the other hand the HOD of computer science wants to look at the performance of the entire students of the department level by level. Lastly, the VC wants only the record of the students that have successfully completed their courses and are ready to go for National Youth Service Corps.

(c) In what ways would you provide the required information?
(d) Assuming there will be problems in (a) if you choose to use tables to provide the required information, what will such a problem be?
(e) In what ways will you fix the problem in (b)?

Question 4

(a) Fig. 1.0 shows at flat file system database: convert this file into database

NUMBER CODE	NAME	ADDRESS	BOOK TAKEN
MS001	**Orok Effiom**	**10, Orok Street, Cal**	**AA34**
MS002	**Orok Orok**	**18, Goldie street, Cal**	**CC056**
MS003	**Orok Bassey**	**25 Ekpo Abasi street, Cal.**	**DD007**
MS004	**Orok Sarah**	**10, Orok Orok street, Cal.**	**KK156**
MS001	**Orok Effiom**	**10, Orok Street, Cal.**	**TT012**
MS002	**Orok Orok**	**18, Goldie street, Cal**	**UU123**
MS003	**Orok Bassey**	**25 Ekpo Abasi Street, Cal**	**NN100**
MS004	**Orok Sarah**	**10, Orok Orok street, Cal.**	**EE156**

Fig. 1.0

(b) Briefly account for the basic group of the SQL
(c) What is meant by data independence

Question 5

(a) Differentiate between Data Base Management Systems
(b) Create a table in MS Access called in "Account table" with the filed names customer identification. Account number: Account Type, Date Opened, and Balance
(c) Write a query statement retrieve records called Ovaltine, orange and cow from tables called fruit, beverage and animal respectively.

Question 6

(a) (i) What does SQL stand for and what role does it play in database? (ii) What is query in DBMS
(b) Highlight the types joins in DBMS
(c) Use the SQL to create a student table given the following field names: Std. Reg. No. Std. First Name: Std. last. Name, Std.City, StdLGA, StdState, StdLevel,

StdCPGA. Apply the integrity rule to the table by making any of filed names you choice a primary key.