JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE & SOFTWARE ENGINEERING

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN SECURITY AND FORENSICS

2Nd YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: IIT 3213

COURSE TITLE: DATABASE ADMINISTRATION AND DESIGN

EXAM VENUE: **STREAM: COMPUTER SECURITY & FORENSICS**

DATE: **EXAM SESSION:**

TIME:

INSTRUCTIONS

1. **Answer Question 1 (Compulsory) and ANY other TWO questions**
2. **Candidates are advised not to write on the question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

Question 1 [30 marks]

a) Define the following terms
   i) Database **(2 marks)**
   ii) DBMS **(2 marks)**
   iii) Primary key **(2 marks)**
   iv) Foreign key **(2 marks)**
   v) SQL **(2 marks)**

b) Briefly discuss the functions of the following:
   i) Database applications
   ii) DBMS **(8 marks)**

c) Given an entity EMPLOYEE use a diagram to discuss any five attributes of this entity **(5 marks)**

d) Define Cardinality. Using one example each briefly discuss three types of Cardinality **(7 marks)**

Question 2 [20 marks]

a) In data modeling we also use IE CrowsFoot. Use diagrams to discuss four types of symbols often associated with IE Crows Foot. **(8 marks)**

b) The following SQL statements allows you to create a table in mysql database.
   i) Draw a table you obtain/see after successfully executing following SQL statements. **(4 marks)**
   ii) Based on the employees table populated with the following data, write a SQL LIKE condition that returns the records whose employee_name ends with the letter "h". **(4 marks)**
   iii) Draw the table representing the results obtained from executing the SQL statement in (b) above. **(4 marks)**

```
CREATE TABLE employees
( employee_number number(10) not null,
  employee_name varchar2(50) not null,
  salary number(6),
  CONSTRAINT employees_pk PRIMARY KEY (employee_number)
);

INSERT INTO employees (employee_number, employee_name, salary)
VALUES (1001, 'John Smith', 62000);

INSERT INTO employees (employee_number, employee_name, salary)
VALUES (1002, 'Jane Anderson', 57500);

INSERT INTO employees (employee_number, employee_name, salary)
VALUES (1003, 'Brad Everest', 71000);
```

Question 3 [20 marks]

a) Briefly discuss the five SQL built-in functions. **(10 marks)**

b) Answer the following questions using the table provided below.

	SKU	SKU_Description	Department	Buyer
1	100100	Std. Scuba Tank, Yellow	Water Sports	Pete Hansen
2	100200	Std. Scuba Tank, Magenta	Water Sports	Pete Hansen
3	101100	Dive Mask, Small Clear	Water Sports	Nancy Meyers
4	101200	Dive Mask, Med Clear	Water Sports	Nancy Meyers
5	201000	Half-dome Tent	Camping	Cindy Lo
6	202000	Half-dome Tent Vestibule	Camping	Cindy Lo
7	301000	Light Fly Climbing Harness	Climbing	Jerry Martin
8	302000	Locking carabiner, Oval	Climbing	Jerry Martin

i) Write a SQL statement that will select buyers whose names begin with Pete. **(3 marks)**

ii) Write a SQL statement that will select buyers whose SKU_Description contain the word "Tent". **(3 marks)**

iii) Write a SQL statement that will produce the result below. **(2 marks)**

	SKU	SKU_Description	Department	Buyer
1	201000	Half-dome Tent	Camping	Cindy Lo
2	202000	Half-dome Tent Vestibule	Camping	Cindy Lo
3	301000	Light Fly Climbing Harness	Climbing	Jerry Martin
4	302000	Locking carabiner, Oval	Climbing	Jerry Martin

iv) Write a SQL statement that will produce the results shown below. **(2 marks)**

	Department	Dept_SKU_Count
1	Climbing	1
2	Camping	2
3	Water Sports	4

Question 4 [20 marks]

a) Define the term normal form. Discuss four types of normal forms. **(8 marks)**

b) Identify and discuss two advantages and two disadvantages of normalization **(4 marks)**

c) Given the table CUSTOMER(CustID, Name, PhoneNumber, AccountBalance), write the standard SQL query to retrieve the Name and Phone Number of customers with a balance greater than 50. **(4 marks)**

d) Use the table above in 2(c) to write the standard SQL query to retrieve the Name and Phone Number of customers whose name begins with 'S'. **(4 marks)**

Question 5 [20 marks].

a) Discuss the main components of an enterprise wide database systems? **(10 marks)**

b) Discuss the main componenets of a data warehouse. **(10 marks)**