

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE (APPLIED COMPUTER SCIENCE)

ACMP 351: INTRODUCTION TO DATABASE

STREAMS:

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 6/12/2017

8.30 A.M – 10.30 A.M

INSTRUCTIONS:

- **Answer Question ONE and any other TWO questions.**
- **Diagrams should be used whenever they are relevant to support an answer.**
- **This is a closed book exam, no reference materials are allowed in the examination room**
- **All mobile phones in an examination room must be switched off.**

SECTION A: COMPULSORY

QUESTION 1: [30 MARKS] COMPULSORY

- a. Using an ER table extract, differentiate between specialization and generalization (5 marks)
- b. Explain FIVE symbols used in development of an ER diagram (5 marks)
- c. Outline the steps of opening a XAMP server to begin developing an SQL database (4marks)
- d. Using an example, explain FIVE SQL database development constraints (6 marks)
- e. Using a SQL example, explain how you can use GRANT and REVOKE permissions in developing databases (5 marks)
- f. Outline FIVE DBMS utilities (5 marks)

SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION

QUESTION 2: [20 MARKS]

- a) below is information provided by a college registrar to aid in developing their database, use it to answer the questions below: -

A university registrar's office maintains data about the following entities:

- *Courses, including number, title, credits, syllabus, and prerequisites;*
- *Course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;*
- *Students, including student-id, name, and program;*
- *Instructors, including identification number, name, department, and title.*
- *Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.*

- i) Draw an ER diagram of the above information (9 marks)
 ii) Add cardinality of the relationships to the ER diagram above (5 marks)

- b) Explain THREE disadvantages of views in databases (6 marks)

QUESTION 3: [20 MARKS]

- a) A student was called upon to develop a database. He quickly developed an un-normalized table, and noted several redundancies as shown in the table below.

Project Code	Project Title	Project Manager	Project Budget	Employee No.	Employee Name	Department No.	Department Name	Hourly Rate
PC010	Pensions System	M Phillips	24500	S10001	A Smith	L004	IT	22.00
PC010	Pensions System	M Phillips	24500	S10030	L Jones	L023	Pensions	18.50
PC010	Pensions System	M Phillips	24500	S21010	P Lewis	L004	IT	21.00
PC045	Salaries System	H Martin	17400	S10010	B Jones	L004	IT	21.75
PC045	Salaries System	H Martin	17400	S10001	A Smith	L004	IT	18.00
PC045	Salaries System	H Martin	17400	S31002	T Gilbert	L028	Database	25.50
PC045	Salaries System	H Martin	17400	S13210	W Richards	L008	Salary	17.00
PC064	HR System	K Lewis	12250	S31002	T Gilbert	L028	Database	23.25
PC064	HR System	K Lewis	12250	S21010	P Lewis	L004	IT	17.50
PC064	HR System	K Lewis	12250	S10034	B James	L009	HR	16.50

- i) Normalize the above table to 3NF and correct the redundancies on the resultant tables (9 marks)
- ii) Explain which attributes from the normalized tables are going to link together to form the relationships (3 marks)
- iii) Write SQL codes for developing the normalized tables (8 marks)

QUESTION 4: [20 MARKS]

- a) Using an example, write SQL syntax for the following operators.
 - i. OR
 - ii. AND (6 marks)
- b) You have been called upon to develop strategies for database security, identify FIVE factors that you would put in place when developing the security strategies (5 marks)
- c) Explain THREE disadvantages of DBMS (6marks)
- d) Outline THREE disadvantages of Hierarchical databases (3marks)

QUESTION 5: [20 MARKS]

- a) Using an SQL example, write TWO ways of getting the system date (5 marks)
 - b) Using an example, explain THREE advantages of normalizing databases (6 marks)
 - c) With reference to SQL JOINS
 - i) Explain what an INNERJOIN command does (2marks)
 - ii) Write a sample inner join SQL command (3 marks)
 - iii) Other than INNER JOIN, name other FOUR joins used in SQL (4marks)
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