

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DIPLOMA IN COMPUTER SCIENCE

COSC 0251: DATABASE SYSTEM 11

STREAMS: DIP COMP SCI Y2S2

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 07/07/2021

2.30 P.M. – 4.30 P.M.

INSTRUCTIONS:

- Answer question **ONE** and **TWO** other questions
- Do not write anything on the question paper
- This is a **closed book exam**, No reference materials are allowed in the examination room
- There will be **NO** use of mobile phones or any other unauthorized materials
- Write your answers legibly and use your time wisely.
- Marks are awarded for clear and concise answers.

SECTION A (Answer ALL questions in this section)

QUESTION ONE [30 MARKS]

- a) Define the following terms
- | | |
|---------------------------------|-----------|
| i. Database security | [2 marks] |
| ii. Database back up | [2 marks] |
| iii. Database management system | [2 marks] |
| iv. Tuple | [1 mark] |
- b) Discuss how Distributed Denial of Service attack occurs in databases [4 marks]
- c) Discuss TWO Data Definition Language (DDL) commands in SQL [4 marks]

- d) Differentiate between system and object privileges [4 marks]
- e) State FOUR back up devices that a business or company can use to back up their data [2 marks]
- f) Discuss what is meant by the term database replication [2 marks]
- g) State THREE advantages of Full replication scheme in databases [3 marks]
- h) Differentiate between a primary key and a foreign key [4 marks]

SECTION B (Answer only TWO questions in this section)

QUESTION TWO [20 MARKS]

- a) Discuss FOUR security threats in database systems [8marks]
- b) Define Roles as used in database systems then create a Role called “developer” with the password 1236 [4 marks]
- c) DCL commands are used to enforce database security in a multiple user database environment. Write an SQL command used to assign user “Admin” all the privileges of the student_database [4 marks]
- d) By the aid of a diagram, discuss the 3-tier DBMS architecture [4 marks]

QUESTION THREE [20 MARKS]

- a) Discuss the following database backups
 - i. Full database backup [2 marks]
 - ii. Differential database backup [2 marks]
 - iii. Log backup [2 marks]
- b) Discuss FOUR SQL constraints [4 marks]
- c) A university registrar’s office maintains data about the following entities: Courses with number, title, credits, syllabus, and prerequisites as attributes, Units, with unit code, year, semester, section number, instructor(s), timings, and classroom as attribute, students with student-id, phone number, email, name, and program and Lecturers with staff number, name, department, and title as the attributes.
 - i. Represent courses and student entities [4 marks]

The relationships between the entities are as follows

A single course contains several units. Students can enroll in only one course, but they pursue several units in a year, a single lecturer teaches several students and several units but only one Course.

- i. Construct an E-R diagram for the registrar’s office [6 marks]

QUESTION FOUR [20 MARKS]

- a) Database security requires one to establish the correct controls and policies for access to the database itself. Discuss THREE controls one can establish in a database system [6 marks]
- b) Discuss the THREE types of data replication [6 marks]
- c) By the aid of diagrams discuss the following replication schemes [6 marks]
 - i. Full replication
 - ii. No replication
 - iii. Partial replication
- d) State FOUR Data Manipulation Language (DML) Commands as used in SQL [2 marks]

QUESTION FIVE [20 MARKS]

EMPNO	ENAME	JOB	DEPTNO	COMM	SALARY
101	John	Manager	1010	25,000	70,000
102	Mark	Clerk	1010	15,000	40,000
103	Eunice	Secretary	1085	17,000	45,000
104	Steve	Analyst	2047	20,000	55000
105	Carro	President	2001	30,000	90,000
106	Faith	Security	1085	5,000	10,000
107	Adrian	Clerk	950	17,000	40,000
108	Lenna	Manager	2047	25,000	70,000
109	Jack	Clerk	1070	10,000	40,000
110	Benuel	Analyst	1019	21,000	55000

- i. Write an SQL command to CREATE the above Employee table with EMPNO as the Primary key (Enforce the right constraints for each attribute) [6 marks]
- ii. Write an SQL command to INSERT the first TWO records into Employee table [4 marks]

- iii. Write an SQL command to display the employees whose salary is above 50,000
[2marks]
 - iv. Write an SQL command to display only the EMPNO and ENAME for employees who are clerks and have a commission above 10,000
[2 marks]
 - v. Some employees were promoted while others were demoted, Bwrite an SQL statement to Update their details in the table respectively
[6 marks]
 - a) John who was initially a manager was later demoted to security and his commission changed to 5,000, a salary of 12,000 and changed the department number to 1085
 - b) Jack who was initially a clerk was promoted from a clerk to a manager, his commission changed to 28,000 with a salary of 60,000and changed the department number to 1010
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