



UNIVERSITY OF NAIROBI

SECOND SEMESTER EXAMINATIONS 2010/2011

FIRST YEAR EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CSC 122: DATABASE SYSTEMS

DATE: 17TH JUNE, 2011

TIME: 11.30 A.M. – 1.30 P.M.

INSTRUCTIONS:

Answer Question 1 and Any Other Two

Section A [Compulsory]

Question 1 (20 Marks; 2 marks each)

- DB system dev:*
1. Database planning
 2. System definition
 3. Requirement collection
 4. Analysis
 5. Database design
 6. Database selection (optional)
 7. Application design
 8. Prototyping (optional)
 9. Implementation
 10. Data conversion & testing
 11. Testing
 12. Operational maintenance
- a) Give four major components of a database system
- b) Give ⁴ major components of a database management system
- c) What are the typical phases of database development?
- d) What is the role of database administration?
- e) What are steps of query processing?
- f) What are the key features of relational databases?
- g) Distinguish between the two basic types of locks
- h) Given the three tables below that represents student, course and course registration details:

Students (regno, surname, othernames, email)

Courses (code, title)

Registration (regno, code, date)

Write SQL statements that:

- i. Creates table *registration* including foreign keys
- ii. Lists students registered for CSC122
- iii. Lists students who have not registered for any course unit

Handwritten notes:

- App. Programs
- Query processor
- File manager
- DBMS
- Database engine
- System Catalog
- Scheduler
- Buffer
- OS
- DBMS
- Query processor
- DML Preprocessor
- Query processor
- Platform object code
- Dictionary manager
- Database manager

executive

Section B [Optional]

- Develop initial entity
- Identify initial relationships
- Validate against existing system
- Expand the ER to accommodate new requirements
- Refine the structure.
- Test with user

Question 2 (15 Marks)

- a) Describe the steps of Database Design. (3 marks)
- b) Describe the steps of Entity Modeling. (3 marks)
- c) Develop an Entity Model for the media advertisement given below. (9 marks)

Question 3 (15 Marks)

- a) What are the advantages of normalization? (2 marks)
- b) Describe the step of normalization. (3 marks)
- c) How does normalization relate to entity modeling? (2 marks)
- d) Normalize the given bookshop order form to third normal form. (8 marks)

Question 4 (15 Marks)

- a) Explain what a transaction is and what its major properties are. (3 marks)
- b) Explain the uncommitted dependency problem. (3 marks)
- c) How can the uncommitted dependency problem be solved? (2 marks)
- d) Explain the use of the following database administration tools: job scheduler, server configuration, performance monitor, database tuner (7 marks)

Question 5 (15 Marks)

- a) What are the functions of logs? Give four types of logs. (2 marks)
- b) Describe the steps you would follow to carry out a database backup. (5 marks)
- c) Explain the key functions of database profiler. (2 marks)
- d) SQL is regarded as the industry standard database query language. Describe the key components of SQL including the associated command. (6 marks)

DDL
DML - HASER
DCL

Application – Media Advertisement

A large media company generates its main business from advertisement. Details about all their clients are entered into the company database. Job orders are received from clients and are booked accordingly. Invoices are raised after which payment is received and accounts updated. Each client account or job is handled by an account executive. A graphics designer may be required to prepare the necessary graphics in readiness for advertisement. Each account executive is paid a commission depending on the amount of business generated. They are also appraised every quarter to ensure they meet targets.

Book Order

<i>Book Order</i> <i>University Bookshop</i>		Order No		
		Date		
Student Details				
Student Id				
Name				
School				
Department				
Phone				
email				
Book Code	Title	Qty	Unit Price	Total
			Sub-Total	
			VAT	
			TOTAL	