



TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR BACHELOR OF TECHNOLOGY IN
INFORMATION COMMUNICATION TECHNOLOGY
(BSCIT J12)

ICS 2206/EIT 4205: DATABASE SYSTEMS

END OF SEMESTER EXAMINATION

SERIES: APRIL 2013

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Define the following database terms:

(i) Database

(ii) Specialization

(iii) Attribute Domain

(iv) Entity

(v) View

(5 marks)

b) Explain **THREE** factors to consider in choosing the physical design of a database. (3 marks)

c) Differentiate between 2 tier and 3 tier client server database approaches. (4 marks)

d) Explain “Redundancy” in file systems and how database systems control redundancy. (4 marks)

e) With the use of an example, differentiate between a “Relation Schema” and a “Relation Instance” (4 marks)

- f) Describe the steps you would follow to normalize data for relational DBMS. (5 marks)
- g) Explain any **THREE** uses of a database system. (5 marks)

Question Two

- a) Explain why you would choose a database system instead of simply storing data in operating system files. (6 marks)
- b) Explain the difference between the term CANDIDATE KEY, PRIMARY KEY FOREIGN KEY and SUPER KEY. (4 marks)
- c) Explain the system catalog (4 marks)
- d) What are the basic components of the ER model? How would you (graphically) identify each of them? (6 marks)

Question Three

- a) Write the SQL statements for the following descriptions. (10 marks)
- (i) Create a table employee with the following fields: emp_num (primary key)
Emp_fname, emp_lname, job_class, hiredate.
 - (ii) Add a new column SSNO to the table employee above
 - (iii) Insert 3 rows of data into the employee table
 - (iv) Display all the employees who belong to job-class "k"
 - (v) Delete an employee whose emp_num F, "001"
- b) Explain the process of designing a database system. (10 marks)

Question Four

- a) Explain the ANSI-SPARC architecture of database. (6 marks)
- b) With the use of an example, explain the INF. (5 marks)
- c) With the use of examples, differentiate between functional and transitive dependencies. (4 marks)
- d) Explain **THREE** advantages of distributed database. (5 marks)

Question Five

- a) With examples, explain how primary key and foreign key concepts are useful in relation to data model? (3 marks)
- b) Explain **FOUR** advantages of database systems. (7 marks)
- c) An orchestra has **FOUR** broad classes of instruments (strings, woodwind; Brass and percussion) Each class contain Musicians who play different instruments for example the string section of a full symphonic orchestra contain 2 harps 16 to 8 violins, 12 violas, 10 cellas and 8 double basses. The manager has asked you to develop a database to store details of the Musician and its Three Orchestras. All the Musicians are specialists and play only one instrument for one orchestra. Draw an ERD mapping all the Cardinality. (10 marks)