



KABARAK

UNIVERSITY

UNIVERSITY EXAMINATIONS

2009/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

COURSE CODE: COMP 314

COURSE TITLE: DATABASE MANAGEMENT SYSTEMS

STREAM: SESSION V

DAY: TUESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 30/11/2010

INSTRUCTIONS:

- 1. This question paper has FIVE questions**
- 2. Answer question ONE and any other TWO questions**

PLEASE TURNOVER

QUESTION ONE (30 MARKS) COMPULSORY

- (a) Explain the meaning of following terms
 - i. Data mining
 - ii. Database integrity (4mks)

- (b) Distinguish between
 - i. Conceptual and logical database design
 - ii. Backward and forward database recovery (4mks)

- (c) Give any four differences between OLTP and data warehouse (4mks)

- (d) For a table to be referred to as relation, it must possess some properties. What are these properties? (5mks)

- (e) Give three functions of a DBMS (3mks)

- (f) The following seven relations resulted from normalization to 3NF.

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Telephone No.		Edition	AUTHORSHIP	PUBLISHER
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		Current Price	<u>Author Name</u>	PublisherName

- i. Identify and list all primary, compound and foreign keys. (4mks)
- ii. Draw an entity relationship diagram for the relations. (6mks)

QUESTION TWO (20 MARKS) ELECTIVE

- (a) Give four examples of data the require to be implemented in object databases (2mks)
- (b) Explain the difference between database and database management system (4mks)

- (c) Before the introduction of the use of databases, file based systems were used to store data. Explain four limitations of file based systems that prompted the introduction to database approach. (8mks)
- (d) With the aid of illustrations, describe hierarchical, network and relational database models (6mks)

QUESTION THREE (20 MARKS) ELECTIVE

(a) Explain the meaning of the terms

- i. Views
- ii. Relations

(4mks)

(b) Consider the relations shown below of boat reservations made by sailors

Sailor

Sid	SName	Grade	Age
22	Justin	7	45
31	Luke	8	55
64	Harold	7	35
74	Bob	9	35

Reservation

Sid	Bid	Day
22	101	10/12/10
22	102	10/11/10
22	103	11/12/10
31	103	11/6/10
31	104	11/12/10
64	101	9/5/11

Boat

Bid	BName	Colour
101	Interlake	Blue
102	Interlake	Red
103	Clipper	Green
104	Marine	Red

Use the above information to perform the following

i. Write an SQL statement that creates the Reservation relation. Constraint the Day field

such that it should after today

(6mks)

ii. Write SQL statements that displays sid, sname, bname and date for sailors who reserved bid 103

(4mks)

iii. Write an SQL statement that displays reservations made in the month of December 2010

(4mks)

iv. Draw a table displayed by the relational algebra

Π [sname, grade, bname((σ bid=101Reserves)Sailors)

(2mks)

QUESTION FOUR (20 MARKS) ELECTIVE

(a) What is the definition of an entity?

(1mk)

(b) Explain the meaning of the following terms

- i. Surrogate key
- ii. Unary relations
- iii. Existence dependency
- iv. Derived attribute

(8mks)

(c) The scenario below is of a company that rents out cottages for holidays and uses a system to keep records of bookings made by customers

A CUSTOMER may book for one or more COTTAGEs and a COTTAGE is booked by one CUSTOMER. Each COTTAGE belongs to an OWNER and an OWNER owns more than one COTTAGEs.

A COTTAGE may have a number of FACILITIES and a FACILITY may also belong to one or more COTTAGEs. Each COTTAGE belongs to a particular CLASS and a CLASS may have many COTTAGEs

- i. Identify all entities in the scenario **(3mks)**
- ii. Draw an overall ER diagram relating all the entities (resolve many to many relationships if they exist). **(8mks)**

QUESTION FIVE (20 MARS)

- (a) What is normalization **(2mks)**
- (b) List any four types of documents that require normalization before they are implemented **(2mks)**
- (c) Describe the procedure of producing a UNF (Unnormalized Form) process in normalization **(4mks)**
- (d) The document below is project allocation to staff of an institution. The No. of days column relates to the planned number of days an employee will spend on the project. A project is assigned a unique code and each project is for a single customer.

Project Code:	3411	project Description:	New Accounts
Customer No.:	3475	Customer Name:	Rift Barkers
Staff No.	Staff Name	Staff Grade	No. of Days
34	Brian	Sen. Prog	12
12	Abigael	Analyst	3
23	Abel	Manager	9

- i. Normalize the document to 3NF showing all the processes **(8mks)**
- ii. Draw an ER diagram resulting from the normalization **(4mks)**