

UNIVERSITY OF AGRICULTURE, ABEOKUTA
COLLEGE OF NATURAL SCIENCES
DEPARTMENT OF COMPUTER SCIENCE

2nd SEMESTER 2008/09 SECOND UNIVERSITY EXAMINATION

TITLE OF THE PAPER: DATA BASE DESIGN
COURSE CODE: CSC422
TIME ALLOWED: 2HRS 30MINUTES
INSTRUCTION: ATTEMPT ANY **FOUR** QUESTIONS

QUESTION ONE

Given a relation film below, write a procedure using cursor pointer that takes a film name **s** as an input argument and produces in output argument **mean** and **variance**, the mean and variance of the length of all the film owned by film name **s**.

film(title, name, year, length, film_type)

QUESTION TWO

Study the following relations and write expressions of relational algebra to answer the queries below

Product(maker, model, type)
Personal_Computer(model, speed, RAM, HDD, price)
Laptop(model, speed, RAM, HDD, price)
Printer(model, colour, type, price)

- (a) Find those manufacturers that sell printers, but not personal computers
- (b) Find the model number and price of all products (of any type) made by manufacturer C.
- (c) Find the model numbers of all black and white laser printers
- (d) Find those hard-disk sizes that occur in two or more personal computers
- (e) Find the manufacturers of personal computers with at least three different speeds
- (f) Find the numbers of the personal computers with the fastest processor among all those personal computers that have the greatest amount of RAM

QUESTION THREE

Author	Title	Year	Price
J.J.Jones	Good Day	2006	45.60
Prof. Dele	Logic	2004	34.90
Obama	Welfarism	2010	50.24
D. Dina	Life & Death	2009	60.20

Table 1: Book

- (i) Write XML database codes for the table 1 with bookstore as the root
- (ii) Write expressions of database XML path to answer the following queries
- (a) select price nodes that are greater than 40.50
 - (b) select all the title and price element of the book
 - (c) select the last but one book element that are children of the bookstore

QUESTION FOUR

Use the relation schemas in question **two** to write the following triggers

- (a) when inserting a new laptop, check that the model number exists in product
- (b) when updating the price of a printer, check that there is no lower priced printer of the same type
- (c) when inserting a new personal computer, laptop or printer, make sure that the model number did not previously appear in any of personal computer, laptop or printer
- (d) when making any modification to the personal computer relation, check that the average price of personal computers for each manufacturer is at least ₦5,000=00

QUESTION FIVE

Consider a relation with schema

film(title, year, length, type)

and

functional dependencies (FD's)

year, length \rightarrow type

length \rightarrow title

title \rightarrow year

- (i) what are all the nontrivial functional dependencies that follow from the given FD's?
- (ii) What are keys of **film**⁺ ?
- (iii) what are all the super keys for **film** that are not keys?
- (iv) Is the relation violate third norm form?
- (v) Is the relation violate Boyce Codd norm form?
- (vi) Decompose in case it violates either third or Boyce Codd norm form
- (vii) Check if the decomposition is lossless join
- (viii) Are the decomposed relations preserved dependencies?

QUESTION SIX

Convert the entity relation diagram of figure 1 to the following:

- (i) relational database
- (ii) object oriented method
- (iii) unified modeling language diagram

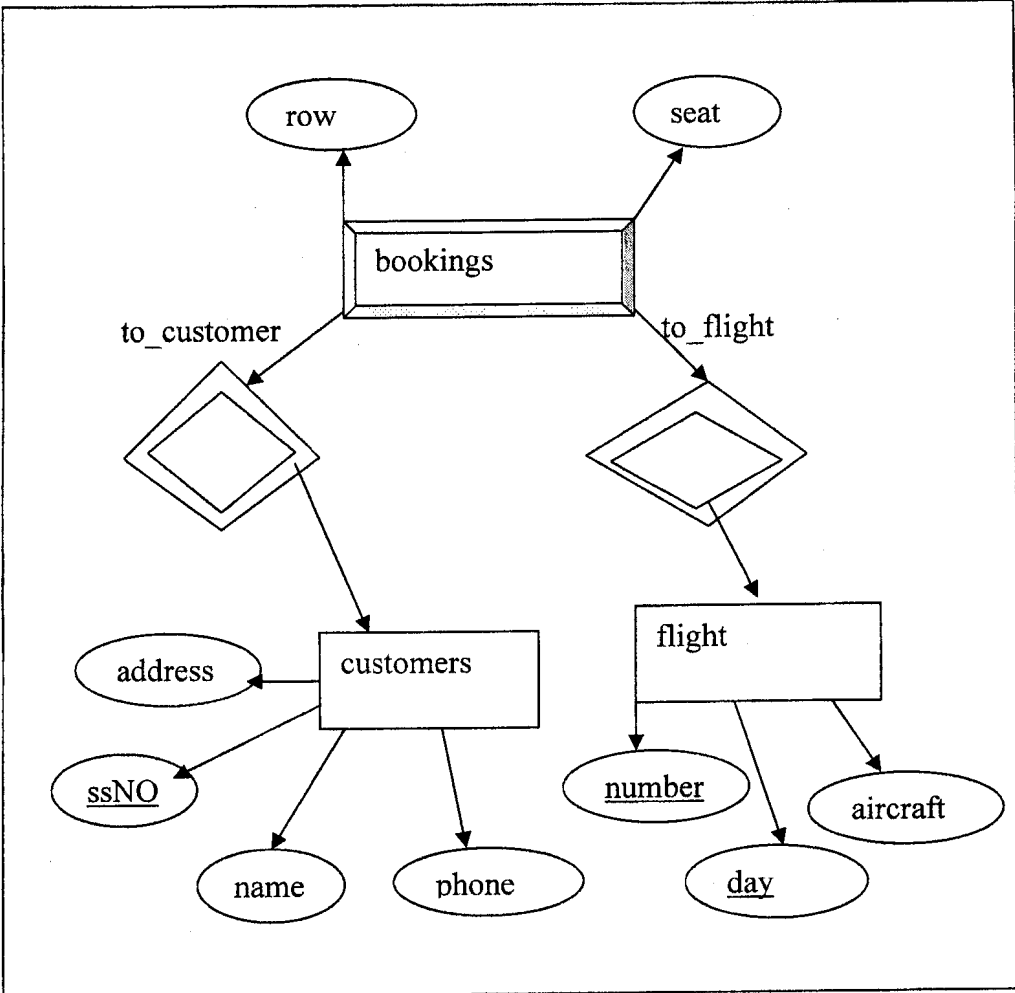


Figure 1: Entity Relation Diagram