

OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY

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**Summer Examinations 2001**  
**Second Year Industrial Engineering and Information Systems**  
**Second Year Management Engineering with Language**

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*IE213: Database Applications*

Dr. Wright,  
Prof. O'Kelly,  
Dr. Sheil,  
Ms. McGlennon.

Answer **three** questions  
Time allowed: **3 hours**

### Q1

- What is a *database*? (3 marks)
- Briefly outline the structure and functions of a Database Management System. (5 marks)
- List and discuss any three considerations when designing a database. (4 marks)
- Define the following terms: *table, record, field, primary key, foreign key*. (5 marks)

### Q2

- What does an *entity relationship* [E-R] *model* define ? (2marks)
- What problems do *many-to-many* relationships create for a systems designer?  
In general how are such problems resolved? (3 marks)

A hospital has 12 wards, each containing up to 10 patients. Individual patients have only one doctor who is allowed to prescribe drugs for them. Doctors do their rounds once a day and prescribe drugs for their patients, as they see fit. A prescription identifies the drug by code and name, since different drugs may have similar names that the pharmacy could confuse, doctors' handwriting being what it is! The prescription also contains the recommended dosage, and length of treatment. The pharmacist types out a label for the drugs container, incorporating notes about the drug, as listed in the catalogue provided by the drugs supplier. After the pharmacy has prepared the drugs they are dispatched via hospital porter to the appropriate patient. Once a month the pharmacy prepares several reports for the hospital management committee. These include one which shows the quantities and cost of each drug issued, and another, which shows the value of drugs issued by each doctor

- Develop an entity relationship (E-R) diagram for the hospital situation described.  
Show the relationships clearly. (12 marks)

### Q3

Explain what is meant by *normalization*?

(5 marks)

Normalize the following table to *Third Normal Form*.

(12 marks)

CustId	Name	Addr.	City	State	ZIP	P#1	Des1	Pr1	P#2	Des2	Pr2
3	Lee	1 Main	Boston	MA	4567	aa123	Windows	300			
4	Jones	2 Sub	Boston	MA	4567	bc345	Ultrix	1000	aa123	Windows	300
4	Jones	2 Sub	Boston	MA	4567	cc345	Unix	2000			

Field	Description
CustId	The unique customer id
Name	Customer name
Address	Customer address
City	City in which customer lives
State	State in which customer lives
Zip	ZIP code of customers home
P#1	Part number for first part owned by customer
Des1	Part description for first part owned by customer
Pr1	Part price for first part owned by customer
P#2	Part number for second part owner by customer
Des2	Part description for second part owned by customer
Pr2	Price price for second part owned by customer

### Q4

Discuss the three rules of *referential integrity* and in each case give an example of how the rule may be violated.

(6 marks)

Write a short note on *queries* to demonstrate your understanding of what queries are, their results/outcomes, and when/why they should be employed.

(6 marks)

List three (**MS ACCESS**) *Action Query* types and state circumstances under which they should be used.

(5 marks)

### Q5

(a) What is a *Form*? When would you use a *Form Wizard* (**MS ACCESS**) ? What control types can be placed on forms? When would you design a form in *Design View* ?

(10 marks)

(b) What is a *Report*? What tasks can be carried out in **MS ACCESS** to customize a standard report?

(7 marks)