

## National College of Ireland

BA Management of Technology in Business (Full-Time)  
BSc (Honours) in Computing (Full-Time and Part-Time)  
BSc (Honours) in Business Information Systems (Full-Time and Part-Time)  
Higher Certificate in Computing (Full-Time and Part-Time)

Year 2

BAMTB2, BSHBIS(E)2, BSHC(E)2 and HCC(E)2

Semester One Examinations – 2011/2012

Saturday 14<sup>th</sup> January, 2012

2.00pm -3.30pm

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### Introduction to Databases

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Dr. Thomas Newe  
Dr. Paul Hayes  
Mr. Brian Gillespie

**Instructions:** Answer Question 1 and One other question.

**Duration of exam:** 1.5 Hours.

**Attachments:** None.

**Question 1 – 50 marks (answer all parts) Compulsory**

(a) Explain the function of each of the following clauses in the SELECT statement:

FROM  
WHERE  
GROUP BY  
HAVING  
ORDER BY

**(10 Marks)**

(b) What is the difference between a subquery and a join? Under what circumstances would you not be able to use a subquery?

**(10 Marks)**

(c) The following tables form part of a database held in a relational DBMS:-

Hotel	( <u>hotelNo</u> , hotelName, city)
Room	( <u>roomNo</u> , <u>hotelNo</u> , type, price)
Booking	( <u>hotelNo</u> , <u>guestNo</u> , <u>dateFrom</u> , dateTo, roomNo)
Guest	( <u>guestNo</u> , guestName, guestAddress)

where Hotel contains hotel details and hotelNo is the primary key;  
Room contains room details for each hotel and (roomNo, hotelNo) forms the primary key;  
Booking contains details of the bookings and (hotelNo, guestNo, dateFrom) forms the primary key;  
and Guest contains guest details and guestNo is the primary key.

You are required to write SQL statements to do the following:

- (i) List full details of all hotels.
- (ii) List full details of all hotels in London
- (iii) List the names and addresses of all guests in London.
- (iv) List all rooms with a price below €40.00 per night, in ascending order of price.
- (v) List the bookings for which no dateTo has been specified.
- (vi) How many hotels are there?
- (vii) What is the total revenue per night from all double rooms?

- (viii) List the price and type of all rooms at the Grosvenor Hotel.
- (ix) Insert a new record into the Hotel table.
- (x) Update the price of all rooms by 5%.

**(10 x 3 Marks)**

**Answer either Question 2 OR Question 3**

**Question 2 – 50 marks (answer all parts)**

- (a) Differentiate between the two main types of data independence in terms of database systems.

**(10 Marks)**

- (b) Describe the main characteristics of the database approach to data management in an organisation and contrast it with the file-based approach.

**(10 Marks)**

- (c) List 5 properties of relational tables.

**(10 Marks)**

- (d) Using appropriate examples illustrate how the participation and cardinality constraints are represented on an Entity-Relationship diagram.

**(20 Marks)**

**Question 3 – 50 marks (answer all parts)**

- (a) In relation to Entity-Relationship Modelling explain each of the following:

- (i) Weak Entity
- (ii) Multi-valued Attribute
- (iii) Recursive Relationship
- (iv) Ternary Relationship

**(4 x 3 Marks)**

(b) Differentiate between Data Administration (DA) and Database Administration (DBA).

**(10 Marks)**

(c) Explain each of the following terms using an example:

- (i) Update anomaly
- (ii) Deletion anomaly

**(2 x 5 Marks)**

(d) Provide a definition for first, second and third normal forms.

**(3 x 6 Marks)**

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