

Faculty of Science and Technology  
Department of Computer Science

## **Module: Database Design & Practice 1**

**Module Code: EBSY505**

Date: 8 May 2015  
Start Time: 10:00  
Duration: 02:00  
Module Leader: Francois Roubert

### **Instructions for Candidates:**

This paper contains 6 Questions.

**ALL 6 QUESTIONS ARE COMPULSORY, ANSWER ALL QUESTIONS**

QUESTION 1 CARRIES 18 MARKS  
QUESTION 2 CARRIES 18 MARKS  
QUESTION 3 CARRIES 06 MARKS  
QUESTION 4 CARRIES 20 MARKS  
QUESTION 5 CARRIES 18 MARKS  
QUESTION 6 CARRIES 20 MARKS

GP-CARE is a large network of general practice (GP) surgeries which employ a number of doctors and nurses all around South East England. Once registered, patients can book an appointment for a test or a consultation and be provided with a prescription for a medication if required.

GP-CARE is seeking to design and develop a database-driven patient management system to be used by both the patients and the members of staff to help GP-CARE organise the management of appointments and prescriptions more efficiently. Users of the system to be developed should be able to register, search and view available appointments, to place or reschedule a booking for an appointment and to request a prescription for a medication.

The Conceptual Entity-Relationship Diagram (ERD) for the GP-CARE patient management system is given on Appendix A (page 4). Carefully consider the conceptual ERD on appendix A.

## Question 1

- (a) Explain in detail the multiplicity of the relationship '*is for*' (between the entities Booking and Appointment).

[8 Marks]

- (b) Explain how you would map the relationship '*is for*' (between the entities Booking and Appointment) to a Logical ERD. Provide a diagram to support your answer.

[10 Marks]

## Question 2

- (a) Explain in detail the multiplicity of the relationship '*consists of*' (between the entities Prescription and Medication).

[8 Marks]

- (b) Explain how you would map the relationship '*consists of*' (between the entities Prescription and Medication) to a Logical ERD. Provide a diagram to support your answer.

[10 Marks]

## Question 3

Consider the 3 functional requirements of the GP-CARE database-driven patient management system below.

R12: View available appointment.

R13: Place a booking for available appointment.

R14: Cancel booking for appointment.

Carefully consider the ERD for GP-CARE on appendix A. For each requirement R12, R13 and R14, explain which entities, attributes and relationships are used and how they are used to ensure that this requirement is completed.

[6 Marks]

## Question 4

- (a) Explain what the '*registers*' relationship between the entities Surgery, Patient and Doctor is and what its meaning is. In your answer, also explain what the attribute regDate is used for.  
**[5 Marks]**
- (b) Explain in detail the multiplicity of the '*registers*' relationship (between the entities Surgery, Patient and Doctor).  
**[5 Marks]**
- (c) Explain how you would map the relationship '*registers*' (between the entities Surgery, Patient and Doctor) to a Logical ERD. Provide a diagram to support your answer.  
**[10 Marks]**

## Question 5

- (a) Explain what the connection is between the entity Staff and the entities Doctor and Nurse and what the value of using this modelling technique is.  
**[8 Marks]**
- (b) Explain how you would map the relationship between the entity Staff and the entities Doctor and Nurse to a Logical ERD. Produce a diagram to support your answer.  
**[10 Marks]**

## Question 6

Consider the Conceptual Entity-Relationship Diagram (ERD) for the GP-CARE patient management system which is given in Appendix A (page 4) and answer the questions below.

- (a) Write a SQL query to display the names and addresses of all the surgeries which operate in the NW postcode.  
**[05 Marks]**
- (b) Write a SQL query to display the full names, addresses, dates of birth and telephone numbers of all the patients who are registered at GP-CARE under the Bond last name and who were born between the 3<sup>rd</sup> March 1981 and the 25<sup>th</sup> October 1988.  
**[05 Marks]**
- (c) Write a SQL query to display the full names and addresses of patients who have placed bookings at GP-Care, along with the dates and times of the bookings and the statuses of the bookings.  
**[10 Marks]**

