

**OLLSCOIL NA hÉireann, CORCAIGH**  
**THE NATIONAL UNIVERSITY OF IRELAND, CORK**

**COLÁISTE NA hOLLSCOILE, CORCAIGH**  
**University College, Cork**

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**CS2509 XML and the Extended Enterprise**

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**Instructions to candidates:**

1. Time available: 1.5 hours
2. Read the complete paper before answering any question.
3. For a perfect score (100%) on this paper, answer all questions correctly.

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INSTRUCTED TO DO SO**

**PLEASE ENSURE THAT YOU HAVE THE CORRECT  
EXAM PAPER**

## Background Information

All the questions in this paper concern the development of a mySQL database-driven web-site for a university whose website is located at <http://www.CorkeryCollege.ie>. The database is called records and can be accessed with the username carbery and the password freke.

Here is information about some of the tables in the database.

A table called staff has the following structure:

```
staffID int(11), category varchar (9), photo varchar(255),  
firstname varchar(20), surname varchar(40), address varchar(60)
```

Each entry specifies the person's name and address, as well as his/her staff category (which is specified by one of the words academic, clerical or technical). It also provides the URL of an image file which contains a photograph of the person.

A table called students has the following structure:

```
studentID int(11), photo varchar(255),  
yearOfBirth int(4), monthOfBirth int (2), dayOfBirth int (2),  
firstname varchar(20), surname varchar(40),  
homeAddress varchar (60), termAddress varchar (60)
```

Each entry specifies the student's name, as well as his/her date of birth and both his/her home and term-time addresses. It also provides the URL of an image file which contains a photograph of the student. Note that, for some students, the term-time address could be the same as the home address.

A table called modules has the following structure:

```
moduleID varchar(6), title varchar(40)
```

Each entry specifies the module's ID (for example CS2509) and full title.

A table called lecturing has the following structure:

```
staffID int(11), moduleID varchar(6)
```

Each entry specifies that some member of staff is teaching some module.

A table called enrollment has the following structure:

```
studentID int(11), moduleID varchar(6)
```

Each entry specifies that some student is enrolled in some module.

**Question 1 (20 percent):**

The university wants to generate an XML document which will contain the information in all the tables described above.

The root element of the XML document should contain five child elements, one corresponding to each of the tables. These child elements should have structures which correspond to the table structures given above.

Provide a DTD specification for this type of XML document.

**Question 2 (40 percent):**

Write an XSL stylesheet file which could be referenced by an XML document that conforms to the DTD you generated when answering Question 1.

This XSL stylesheet should generate a HTML table containing one row for each member of academic staff in the XML document and containing the following two columns: name of staff member; a list of the modules which (s)he is teaching. In this HTML table, the academic staff should be sorted alphabetically by surname and firstname.

**Question 3 (40 percent):**

Write an XSL stylesheet file which could be referenced by the XML document that conforms to the DTD you generated when answering Question 1.

This XSL stylesheet should generate a HTML table containing one row for each student aged less than twenty who is not living at home during the term. (When computing a student's age, assume that the current year is 2017 and just compute an approximate age based on the year of the student's birth.) The table should contain the following columns: the name of the student; a photograph of the student; the student's date of birth; the number of modules (s)he is studying. In this table, the students should be sorted by year of birth.