# _LITfinalLOGO

# SUMMER EXAMINATIONS 2015

**Thursday, 14th May 2015, 14.30 p.m. – 17.30 p.m.**

**KSDEM\_8\_Y2**

**Course:** Bachelor of Science (Hons) in Software Development

**Year:** Two

**Subject:** Data Driven Applications

**Time Allowed:** 3 Hours

**Instructions: 1. ANSWER FOUR QUESTIONS AS FOLLOWS:**

* ANSWER Question One (1) in PART A
* ANSWER Question Two OR Question Three in PART A
* ANSWER Question Four AND Five in PART B

**2.** Indicate clearly on the front of the answer book which

questions have been attempted.

**Additional Attachments or Exam Material to accompany this paper:**

### Candidates are permitted to access their instance of Microsoft SQL Server which is required to complete the practical questions.

**Internal Examiners: External Examiners:**

Mr. Gerry Guinane Dr Brian Keegan

**PART A:**

**Q1. DATABASE SYSTEMS TERMINOLOGY**

**Note: This question requires written answers only.**

**a)** What is ADO.NET? Briefly describe the main functions of each of the following classes :

* System.Data.SqlClient.SqlConnection
* System.Data.SqlClient.SqlDataAdapter
* System.Data.DataSet.

**(8 marks)**

**b)** Identify and provide a clear description of three major data storage models used in DBMS. Use diagrams and/or examples to support and illustrate your answer. Which model is used in Microsoft SQL Server?

**(12 marks)**

**(Total 20 Marks)**

**Q2. Database Systems Architecture & Web applications**

**Note: This question requires written answers only.**

**a)** In terms of Computer Systems explain what is meant by ‘Client-Server

Architecture’ . Provide examples of the types of Server typically found in

such an architecture. **(8 marks)**

**b)** A hotel requires a website ([www.roombook.ie](http://www.roombook.ie)) to be set up which supports

online room booking by the general public. You propose to use a Client

Server Architecture consisting of open source (XAMPP) components.With

the aid of a network diagram identify each component of the system. Briefly

describe the role of each component of the system. **(8 marks)**

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**c)** A user uses a browser to access the website [www.roombook.ie](http://www.roombook.ie) to search

for the availability of a room. The user enters required dates in an enquiry

form and hits a ‘Search’ button on the form. You can assume that the

server side scripting is written in PHP. Provide a brief step by step

description of what happens at each of the components of the system

between when the ‘Search’ button is pressed and the response appears on

the browser screen.  **(14 marks)**

**(Total 30 Marks)**

**Q3. Functional Dependency**

**Note: This question requires written answers only.**

Instructions:

1. If you have not already done so - In your exam drive DATA folder - Locate the SQL backup script ‘collegeonline2015.sql’. Restore the ***collegeonline2015*** database to your **MySQL Server**.

**a)** In the context of data modelling – what is meant by Functional Dependency (FD)? **(4 marks)**

**b)** What are the requirements for 1st, 2nd and 3rd normal form? Use a FD diagram to illustrate your answer in each case. **(6 marks)**

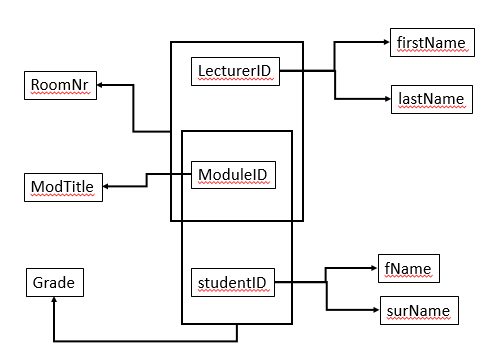
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**c)** Given the following FD diagram – normalise it to 3rd normal form clearly

showing and labelling each step of the analysis. Document your final

design using relational notation. **(12 marks)**



**d)** Draw a FD diagram for the result of the following SQL query on the ***collegeonline2015*** database.

SELECT \*

FROM lecturer l, usertype u, menuitems m

WHERE

l.usertype\_idusertype=u.idusertype

AND

m.usertype\_idusertype=u.idusertype;

**(8 marks)**

**(Total 30 Marks)**

**PART B:**

IMPORTANT!! Save your work REGULARLY

**Q.4 Relational Notation and EER Modelling**

**Note: This question requires written answers only.**

Instructions:

1. If you have not already done so - In your exam drive DATA folder - Locate the SQL backup script ‘collegeonline2015.sql’. Restore the ***collegeonline2015*** database to your **MySQL Server**.
2. This question requires both written answers and answers saved on your exam drive.

**a)** Write a full and accurate relational notation description of the *collegeonline2015* database. All datatypes and keys must be clearly identified and included. **(12 marks)**

**b)** What are the EER modelling diagrammatic conventions for the following

relationship types :

One to One,

One to Many

Many to Many.

What table design rules may be applied for each of these E/R relationship types? **(9 marks)**

**c)** Draw an EER model of the *collegeonline2015* database.  **(7 marks)**

**(Total 28 Marks)**

**Q. 5 PHP,MySQLi and Stored Procedures**

**Note: Parts (a) and (c) require written answers.Part (b) requires answers to be saved on your exam drive.**

Instructions

1. In your exam drive Q5/SOURCEFILES folder you will find a PHP web application “College Online 2015” which uses the database you have restored *‘collegeonline2015’*.
2. Move the web application to your Apache Web Server ‘htdocs’ folder.
3. Load the web application index.php page you should see a page that looks like Fig 1 below.

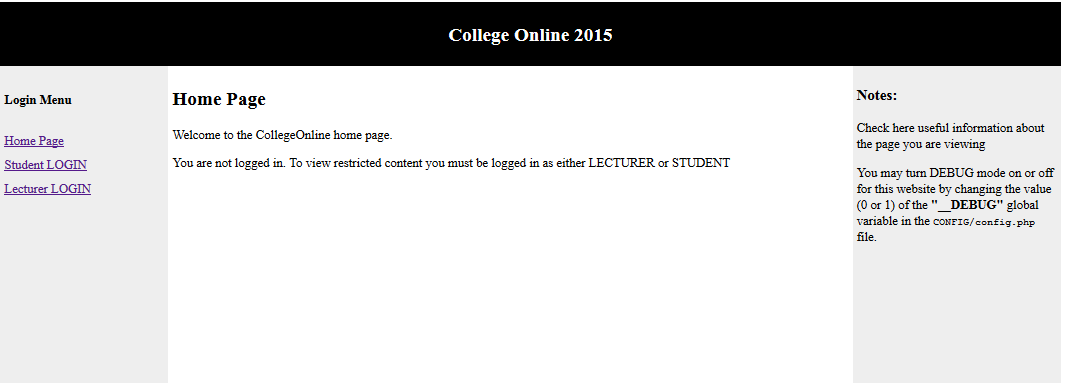


Fig 1 – College Online Home Page

Note – you can switch on the web application debug mode at any time by changing the \_\_DEBUG flag to 1 in the CONFIG/config.php file. Debug information will appear at the bottom of the web page you are viewing.

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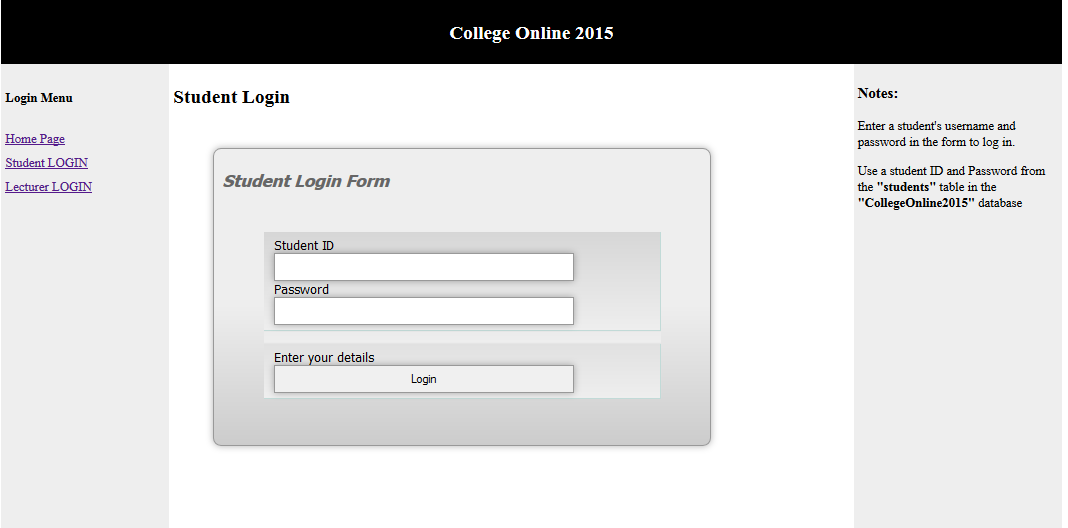
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Once you have the web application set up – then perform the following tasks:

**a)** On the index.php page – click on either of the STUDENT or LECTURER login links. You will see an ERROR message. Fix the cause of the error. Describe the change that you had to make to fix the error. Why did the error message appear?

**(4 marks)**

**b)** On the index.php page – click on the STUDENT login link. You will see a login form. It will look like this:



Open the corresponding PHP file “*studentLogin.php*”. On line 81 you will see the following:

$sql = "CALL studentLogin('$userID','$userPW',1)";

This is a call to a MySQL stored procedure. You are required to implement the corresponding MySQL stored procedure (studentLogin). See comments on lines 82-90 of the PHP file.

To test your solution - Login using the student login link as

Student ID=” 'K01022975'

password=’password’.

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**Part (b) Deliverables**

-Take a screenshot of the index.php page after successful login. Save it in a WORD document named “Q5”

-When logged on as the above student. Click on the transcript link. Take a screenshot of the transcript results page. Add it to the WORD document.

-Copy your stored procedure from MySQL. Save it in the WORD document

-Back up the MySQL database

-Save your WORD Document and your database backup in your exam drive Q5/ANSWER folder.

-When you are done – logout.

**(12 marks)**

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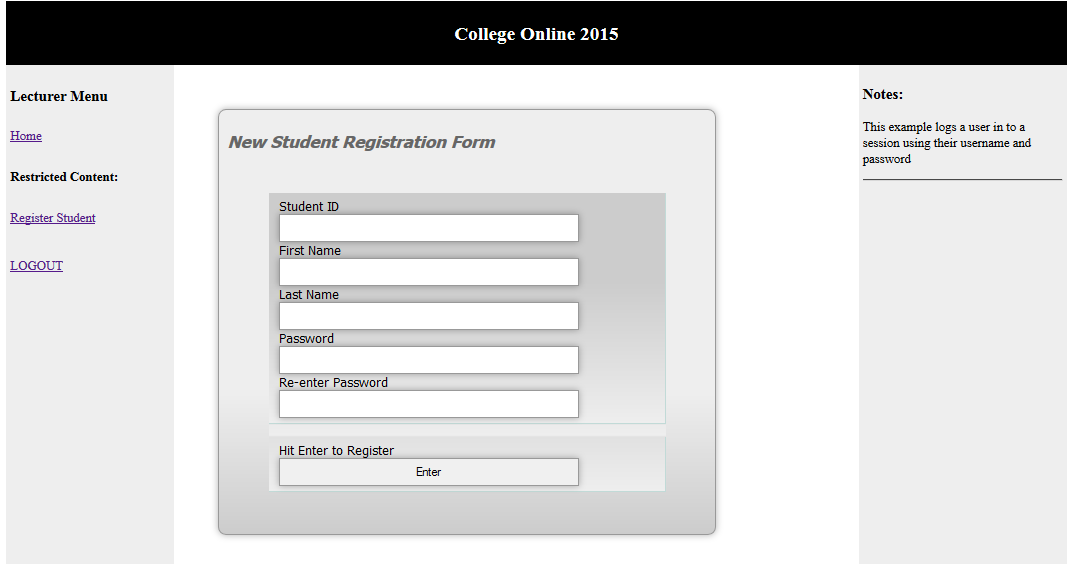
**c)** Carry out the following tasks

* Login as Lecturer using

Lecturer ID= “A00024”

Password=”john”

* Click on the ‘Register Student’ link - You will see a register student form:



* Open the corresponding PHP file *“lecturerRegisterStudent.php*”. On line 66 you will see the following line of code:

$studLastName=$conn->real\_escape\_string($\_POST['studLastName']);

Provide a detailed written explanation of every part of this line of code.

**(6 marks)**

**(Total 22 Marks)**