# ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
## ORGANISATION OF ISLAMIC COOPERATION (OIC)
## Department of Computer Science and Engineering (CSE)

**SEMESTER FINAL EXAMINATION**                    **SUMMER SEMESTER, 2019-2020**
**DURATION: 1 HOUR 30 MINUTES**                              **FULL MARKS: 75**

## CSE 4635: Web Architecture

**Conform to the rules of the examination. Violation of any of the rules may result in termination.**
There are **3 (three)** questions. Answer **all of them**.
Write Student ID and Page Number on all pages. The first page should contain Student ID and Name.
Submission pdf of the answer script should be named as **Full_Student_ID<space>Course Code.pdf**
Figures in the right margin indicate marks.

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1.  With the advent of different ride sharing platforms in Bangladesh, many taxi cab services have gone out of business. Mr. X, the CEO of XYZ Taxi Cab Ltd. wants to stay relevant in the current transport scenario of Bangladesh and has hired your team to develop an application that will allow users/customers to rent taxi cabs easily on the fly. The requirements of his application are as follows:

    - He initially wants to develop a web application so that anyone can access the services of his application from any device.
    - He wants to make sure that the application is scalable so that it can support growing number of users in the future.
    - Users will have to register to avail the services.
    - Users will set their location through the application's UI and the application will locate nearby cab drivers and send a cab driver to the users' locations.
    - Users will be able to schedule a ride for the future.
    - Users can pay the charge for the ride service through bKash, card or cash.
    - After the ride is complete, the user can give ratings for the ride service.
    - Information about the users, each ride, ratings etc. will be stored in a database.
    - In the future, Mr. X wants to add more services like hotel and airport pickup, parcel services etc. through his application.

    a) Based on the requirements mentioned above, which web architecture is the most suitable to implement this system and why?    5

    b) Mention which technologies you want to use to implement the different parts of the system.    5

    c) Based on the advantages of your proposed architecture, how will you implement the business logic of the application so that you can ensure the requirements are maintained? Which kind of business logic technology will you be using to implement the different components of your application? Explain.    7

    d) Draw an architectural diagram that shows each layer/tier of your application, and also shows the relationship between different parts of the application.    8

2.  You have been hired to develop a system for an online vacation planning company. The requirements/features laid out by the company are as follows:

    i.   The company wants to offer a 'planner' that will help customers plan their dream vacation of choice e.g., set destination, book hotel rooms, manage expenses, set places to visit etc.

    ii.  The company wants to offer a service that keeps track of its customers arriving at an airport so that they can pick them up from the airport and offer them transport to their designated hotels.

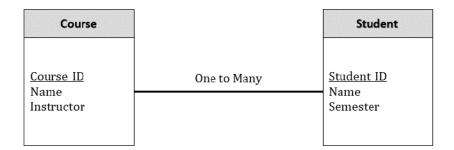    iii. The company wants to use a service that informs its customers about the weather

conditions of any particular holiday location. The service should also send periodic notifications to the customers in case the weather of any particular location takes a turn for the worse.

    iv.   In case a customer has already used the services of the company before, he/she can check his previous travel history by simply passing his customer ID to the online vacation planning company.

a) How does dependency injection help in improving your code? Explain with an example.    3

b) Assuming that you're using EJB to implement this system, for features marked (i), (ii) and (iii), what kind of EJBs would you need to use and why? Explain.    10

c) Assume that you're using RMI to implement the feature marked (iv).    6+6

    1) Explain what java classes you would need to create for implementing this system. What other classes should these classes be inheriting and why? [Note: You don't have to write the code for any of these classes, just explain what these classes will do.]

    2) Write down the code snippets for the client and server program, highlighting the main code of RMI.

3  a) Write a JavaScript function to get values of the first and last name of the following form:    6

```
<form id="form1" onsubmit="getFormValue()">
First Name:<input type="text" name="fname" id="fname-input" value="x">
<br>
Last Name:<input type="text" name="lname" id="lname-input" value="x">
<br>
<input type="submit" class="submit-btn" value="Submit">
</form>
```

b) What is DAO pattern? Give a real-life example showing how you can use DAO pattern and Entity beans.    12

c) Observe the following diagram and answer the subsequent questions:    7

| Course | | Student |
| --- | --- | --- |
| Course ID<br>Name<br>Instructor | One to Many | Student ID<br>Name<br>Semester |

Here, Course_ID and Student_ID are primary keys that need to be autogenerated. Any ID generation scheme can be used. Now, assuming bidirectional association, create proper Entity classes for these two tables, maintaining the proper relationship between them.