UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 5 Examination in Engineering: December 2020

Module Number: EE5209   **Module Name: Web Application Development**

Part II - [1 Hour and 45 minutes]

[Answer all questions, each question carries 05 marks]

Instructions to Candidates

The paper consists of two parts, Part-I and Part-II. You should first write answers to Part-I which will be collected after 1 Hour and 15 minutes.

Q1

a) Briefly discuss the benefits of using Entity Framework core.   [0.5 Marks]

b) What is the use of entity framework migrations?   [0.5 Marks]

c) What is the use of the Database Context class when using entity framework?   [0.5 Marks]

d) Write the entity classes and the database context class for the following ER diagram section give in Figure Q1-a.   [2.0 Marks]

Course

Properties
- CourseID
- Title
- Credits

Navigation Properties
- Enrollments

Enrollment

Properties
- EnrollmentID
- CourseID
- StudentID
- Grade

Navigation Properties
- Course
- Student

Student

Properties
- ID
- LastName
- FirstMidName
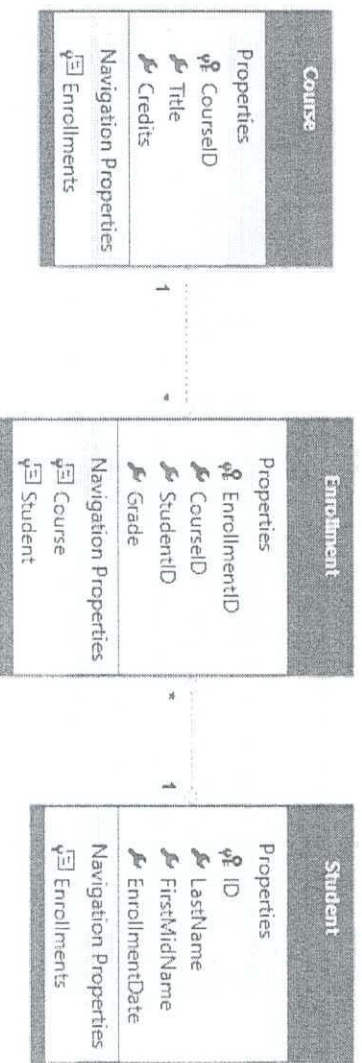- EnrollmentDate

Navigation Properties
- Enrollments

Figure Q1-a)

e) Explain the steps to add the new Department table to the existing code write the necessary commands. Refer to Figure Q1-b).   [1.5 Marks]

Figure Q1-b

Course

Properties
- CourseID
- Title
- Credits

Navigation Properties
- Enrollments

Enrollment

Properties
- EnrollmentID
- CourseID
- StudentID
- Grade

Navigation Properties
- Course
- Student

Student

Properties
- ID
- LastName
- FirstMidName
- EnrollmentDate

Navigation Properties
- Enrollments

Department

Properties
- DepartmentID
- Name
- Budget
- StartDate
- InstructorID

Navigation Properties
- Courses

1

Q2   Answer the following questions using the knowledge on Asp.Net Core.

a)   Briefly explain MVC architectural pattern.   [1.0 Marks]

b)   Briefly explain the use of the following attributes in ASP.Net MVC. [Required], [Authorize]
                                                                                          [1.0 Marks]

c)   What is the behavior of Dependency Injection?   [0.5 Marks]

d)   Briefly explain the Singleton, Transient, and Scoped behaviors of Dependency Injection
      in Asp.Net Core?   [1.5 Marks]

e)   What is the purpose of using Swagger for an API?   [1.0 Marks]
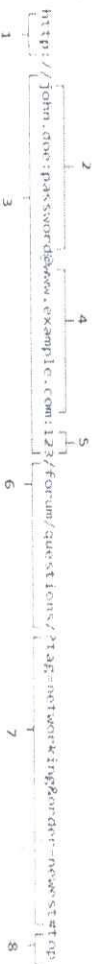
Q3   Answer using the knowledge on Angular

a)   Write the commands to generate a new component "TestComponent".   [0.5 Marks]

b)   Write the commands to generate a new service "TestService".   [0.5 Marks]

c)   Briefly explain the behavior of a Pipe using a sample pipe.   [1.0 Mark]

d)   What is the use of metadata in Angular?   [1.0 Mark]

e)   Briefly explain the behavior of the below code snippet.   [2.0 Marks]

```
@Component ({
selector: 'my-app',
templateUrl: 'app/app.component.html'
})
```

Q4　a)　Name the components 1-8 of a generic URI.　　　　　　　　　　　　　　　　　　　　[1.0 Mark]

```
http://john.doe:password@www.example.com:123/forum/questions/?tag=networking&order=newest#top
        1    2        3       4            5         6                    7                    8
```

b)　Briefly explain HTTP Request-Response Lifecycle using a simple diagram.　　　　　　　[1.0 Mark]

c)　What are the behaviors of a REST API related to GET, POST, PUT, and DELETE HTTP methods?　[1.0 Mark]

d)　Briefly explain the following behavior connectionless protocol and stateless protocol in HTTP.　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　[1.0 Mark]

e)　Name QUIC the new transport layer introduced with HTTP/3.　　　　　　　　　　　[0.5 Marks]

f)　Name one of the problems to be resolved with HTTP/3.　　　　　　　　　　　　　[0.5 Marks]

Q5　a)　Briefly explain what is Node.js engine and what are the benefits of using node.js over standard JavaScript engines which are used on browsers.　　　　　　　　　　　　　[1.0 Marks]

b)　Explain the behavior of following code segment.　　　　　　　　　　　　　　　　[1.0 Marks]

```
const express = require('express');
const bodyParser = require('body-parser');
const url = require('url');
const querystring = require('querystring');
const Article = require('./models').Article;

let app = express();
app.use(bodyParser.urlencoded({ extended: false }));
app.use(bodyParser.json());

app.get('/', async function(req, res) {

    let articles = await Article.findAll();

    res.status(200).json(articles);

});

let server = app.listen(8080, function() {
    console.log('Server is listening on port 8080')
});
```

c)　Modify the code segment to add a new article using a post method consider Article.add(<article>) method is defined in the class article.　　　　　　　　　　[1.0 Marks]

d)　What is the use of a driver library in a ORM framework　　　　　　　　　　　[0.5 Mark]

e)　Explain the following code segment.　　　　　　　　　　　　　　　　　　　　[1.5 Marks]

```
var MongoClient = require('mongodb').MongoClient;

MongoClient.connect('mongodb://localhost:27017/', function(er
r, client) {
    database = client.db('demo');
    pizzaCollection = database.collection("pizza");
    {
        const pizzaDocuments = [
```

```
    name: "Neapolitan pizza",
    shape: "round",
    price: 1500,
    toppings: [ "San Marzano tomatoes", "mozzarella di
bufala cheese" ],
  },
  {
    name: "Margherita",
    shape: "square",
    price: 1300,
    toppings: [ "mozzarella cheese" ],
  },
  {
    name: "Pizza Marinara",
    shape: "round",
    price: 2100,
    toppings: [ "shrimp", "mussels" ],
  }];

  const result = await
pizzaCollection.insertMany(pizzaDocuments);

  const findResult = await pizzaCollection.find({
    shape: "round",
    price: {
      $gte: 1000,
      $lt: 2000,
    },
  },
);
}
);
```