



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 05 Examination in Engineering: March 2022

Module Number: EE5209

Module Name: Web Application Development

[Three Hours]

[Answer all questions]

Question paper consists of two parts. Part I: MCQ and Part II: Essay.

Answer Part I first. Mark the answers on the provided sheet. Time allowed for answering Part I is 45 minutes. The answer sheet of MCQ will be collected 45 minutes after distribution of the paper.

Part I: Multiple Choice Questions

Answer all questions. Time allowed for Part I is 45 minutes. Each question carries 0.5 mark.

- 1) There are _____ levels of heading in HTML.
 - a) Three
 - b) Four
 - c) Five
 - d) Six
- 2) Which of the following tags do not require a terminator?
 - a) <u>
 - b)

 - c)
 - d) None of the above
- 3) Which one of the following tags is used to insert graphics in the webpage?
 - a) <image>
 - b) <images>
 - c)
 - d) <graphics>
- 4) html comment should be enclosed between
 - a) <!-- and -->
 - b) <! And !>
 - c) <!-- and -""
 - d) None of the above
- 5) _____ tag is used before beginning of the paragraph text.
 - a) <textarea>
 - b) <sup>
 - c) <p>
 - d) <h1>

- 6) The _____ element can be used to identify your html file to the outside world.
- a) title
 - b) body
 - c) head
 - d) None of the above
- 7) The tag to give visual division between sections of the page and which causes the browser to draw an embossed line is
- a) <hl>
 - b) <hr>
 - c) <ur>
 - d) None of the above
- 8) HTML is an acronym for
- a) Hypertext marking language
 - b) Hypertext making language
 - c) Hypertext markup language
 - d) Hyper transport markup language
- 9) HTTP stands for
- a) Hyper Text Transfer Protocol
 - b) Hyper Text Transfer Process
 - c) Higher Text Transfer Process
 - d) None of the above
- 10) URL is the acronym for
- a) Uniform research location
 - b) Uniform resource locator
 - c) Uniform resource location
 - d) Uniform resistor locator
- 11) What is the correct statement from the followings?
- a) MongoDB is classified as a NoSQL database
 - b) MongoDB favours XML format more than JSON
 - c) MongoDB is column-oriented database store
 - d) All the above
- 12) Which of the following format is supported by MongoDB?
- a) SQL
 - b) XML
 - c) BSON
 - d) All the above
- 13) MongoDB Queries can return specific fields of documents which also include user-defined _____ functions.
- a) Javascript
 - b) C
 - c) C++
 - d) All the above

- 14) MongoDB is a _____ database that provides high performance, high availability, and easy scalability.
- a) graph
 - b) key value
 - c) document
 - d) All the above
- 15) Dynamic schema in MongoDB makes _____ easier for applications.
- a) inheritance
 - b) polymorphism
 - c) encapsulation
 - d) none of above.
- 16) Which of the following is not a NoSQL database?
- a) SQL Server
 - b) MongoDB
 - c) Cassandra
 - d) none of above.
- 17) Most NoSQL databases support automatic _____ meaning that you get high availability and disaster recovery.
- a) processing
 - b) scalability
 - c) replication
 - d) all the above
- 18) Which of the following methods returns one document in Mongo?
- a) findOne()
 - b) findOne1()
 - c) selectOne()
 - d) none of above.
- 19) Which of the following query selects documents in the records collection that match the condition { "user_id": { \$lt: 42 } }?
- a) db.records.findOne({ "user_id": { \$lt: 42 } }, { "history": 0 })
 - b) db.records.find({ "user_id": { \$lt: 42 } }, { "history": 0 })
 - c) db.records.findOne({ "user_id": { \$lt: 42 } }, { "history": 1 })
 - d) db.records.select({ "user_id": { \$lt: 42 } }, { "history": 0 })
- 20) Which of the following command displays the list of databases in Mongo?
- a) show db
 - b) show dbs
 - c) show data
 - d) display dbs

- 21) What would be the appropriate URL for the following method?
- ```
public class UserController:Controller
{
 public IActionResult CreatetUser(CreateUserRequest user)
 {
 // logic to return add a user to the system
 }
}
```
- a) GET /users  
b) GET /users/{userId}
- c) POST /users  
d) All the above
- 22) What is ActionResult()?
- a) It is an abstract Class  
b) It is a Concrete Class
- c) Both A and B  
d) None of above
- 23) What is JWT?
- a) JSON Web Token  
b) Java Web Token
- c) Javascript Web Token  
d) None of above
- 24) An instance of \_\_\_\_\_ class represents a session with the underlying database.
- a) DbContext  
b) DbSet
- c) Entity  
d) DbSession
- 25) MVC stands for
- a) Model, Vision & Control  
b) Model, View & Controller
- c) Model, ViewData & Controller  
d) Model, Data & Controller
- 26) The correct syntax for do while loop is
- a) do; { statement; }while (condition);  
b) do(condition) { statement; }while;  
c) do { statement; }while (condition)  
d) do { statement; }while (condition);
- 27) What is the method that can remove white space from a string?
- a) Split()  
b) Substring()
- c) Trim()  
d) TrimStart()

- 28) Which of the following is a correct Attribute in Aps.Net MVC?
- a) Authorize
  - b) Display
  - c) Validate
  - d) None of the above
- 29) What is the command for creating a new component Test in Angular?
- a) npm new component Test
  - b) ng generate component Test
  - c) ng g c Test
  - d) Both b) and c)
- 30) Which file is responsible for startup of Angular project?
- a) index.js
  - b) main.ts
  - c) app.ts
  - d) None of the above

## Part II: Essay questions

Answer all questions. Questions Q1, Q3, Q4, Q5, and Q6 carries 5 Marks each and Q2 carries 10 Marks. Time allowed for part II is 2 hours and 15 minutes.

Q1. Answer the following using the knowledge on HTTP.

- a) Name QUIC the new transport layer introduced with HTTP/3. [1.0 Mark]
- b) Name one of the problems to be resolved with HTTP/3. [1.0 Mark]
- c) Explain the REST API standards correlating to HTTP protocol. [3.0 Marks]

Q2. Answer the following using the knowledge on APS.Net and MVC pattern.

- a) Explain the MVC pattern structure using an example. [2.0 Marks]
- b) What is dependency injection? Explain using a simple diagram. [1.0 Mark]
- c) Name and explain the dependency injection scopes in APS.Net Core. [2.0 Marks]
- d) What is scaffolding in ASP.net MVC and how it is useful in rapid application development? [2.0 Marks]
- e) What is the purpose of using Swagger for an API? [1.0 Mark]
- f) Explain the use of **appsettings.json** in a ASP.net MVC core project and mention 2 configurations that support by ASP.net by default. [2.0 Marks]

Q3. Answer the following using the knowledge on Entity Framework core.

- a) Explain DataContext and Migrations. [1.0 Mark]
- b) Write the entity classes for the ER diagram shown in Figure Q3. [3.0 Marks]
- c) Write commands for creating migrations and updating the database. [1.0 Mark]

Q4. Explain the following code snippet in Angular.

```
import {Component} from '@angular/core';
@Component ({
 selector: 'my-app',
 template: `<h1>Hello {{name}}</h1>`,
})
export class AppComponent {name = 'Angular'; }
```

[5.0 Marks]

Q5. Write a small program that can return all Books (entity) in a database using Node.js platform. Use below hints.

- Use express, body-parser, url, querystring
- Import Book form models
- Map '/' path to GET method to return books
- Listen on port 8080

[5.0 Marks]

Q6. Answer the following using the knowledge on CQRS.

a) What does CQRS stand for?

[1.0 Mark]

b) Explain the behavior of the pattern using a small diagram.

[2.0 Marks]

c) Explain a challenge that occurs with the implementation of the CQRS pattern.

[2.0 Marks]

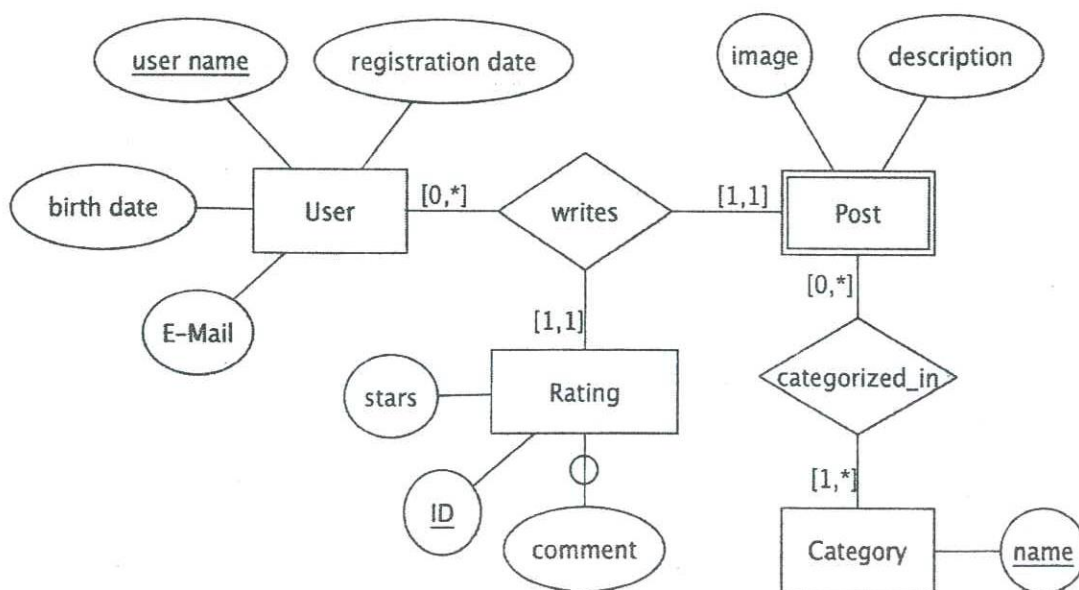


Figure Q3.