CS425 – Software Engineering

Final Exam: Structure and Review Points

The Final Exam will consist of questions given in 2 parts, as follows:

**Part 1: Theory** – This part will be composed of Knowledge-based questions, including Short answer questions, True/False questions (some + rationale), Multiple-Choice questions and some short/small coding questions.

**Part 2: Software Engineering & Enterprise Web Application development skills** – This part will be composed of question(s) requiring software design and coding.

The Exam will be all computer-based. i.e. You will use computers for both parts 1 and 2. However, for any design diagrams needed, you are free to draw using Pencil and Paper; take a photo of your diagram and upload to submit.

The exam duration will be 2 hours (timed from 10 am to 12 noon).

The following are the relevant lessons/topics and sample questions:

Lesson 10: Data Persistence

1. What is Data Persistence?
2. Data relationships
   1. Associations:
      1. Unidir
      2. Bidir

Students

|  |  |  |
| --- | --- | --- |
| StudentId | Name | TranscriptId |
|  |  |  |

Trascripts

|  |  |  |
| --- | --- | --- |
| TranscriptId | Degree | StudentId |
|  |  |  |

The above two DB tables correctly represents a bidir one-to-one association between student and transcript entites. True or False

1. What is JPA? What is Hibernate? How are they related?:
   1. Some essential JPA Annotations
      1. @Entity
      2. @Id
      3. @GeneratedValue
      4. @NotNull - != null
      5. @NotEmpty 🡪 != “” (for String, List)
      6. @NotBlank 🡪 != “ “ (for String)
2. What is Spring Boot? What is Spring Data JPA?
   1. Some essential Spring Data JPA API
      1. @Repository
      2. CrudRepository, PagingAndSortingRepository, JpaRepository
      3. …
   2. …
   3. …
3. …

Lesson 11: Spring Web MVC

1. What is Spring Web MVC?
2. What is the name of the Enterprise Application Design Pattern that Spring Web MVC framework implements?
   1. Front Controller pattern (PoEAA book by Martin Fowler)

DispatcherServlet

HandlerMapping

Controller

ViewResolver

View (jsp, thymeleaf etc.)

1. …

Lesson12: REST API

1. What is REST?
2. What are the advantages of implementing a RESTful Service architecture?
   1. …
   2. …
3. How to implement a RESTful Web API solution:
   1. Solution for Lab Assignment 12
4. ...

Lesson14: Testing

1. What is a Unit Test? And how does it differ from an Integration Test?
   1. …
2. What are the principles/best practices for a good Unit Test?
3. What framework is used for Unit Testing in Java?
4. What is Mocking?
5. What framework is used for Mocking in Java
6. How to implement Unit Testing and Mocking:
   1. Solution for Lab Assignment 14
7. …
8. …

**Note:** *For some of the questions/tasks in the part2 of the Exam, you will be expected to take screenshot(s) of your work/result(s), and save them to an image file (.png or .jpg or .jpeg only) and include these in the zip file, which you will submit.*

***Also, when you take the screenshots, it should be of the entire computer screen (NOT a snippet or a window***

**//-- The End --//**