QUIZ 2 – Ruby and Web Infrastructure

WEBD 5201 Web Development Frameworks

Name: _____

Student Id: _____

1) Which of the following best describes a functional requirement? (2 Marks)
   a) It defines how a system should behave in specific scenarios.
   b) It specifies the performance and quality characteristics of a system.
   c) It outlines the project's budget and resource allocation.
   d) It defines the technology stack and programming language to be used.

2) What does the non-functional requirement address? (2 Marks)
   a) The specific features and functionalities of the system
   b) The System's performance, security, and usability characteristics.
   c) The budget and financial resources required for the project.
   d) The project's schedule and timeline for completion.

3) Imagine you run a popular e-commerce website, and during the holiday season, you experience a sudden surge in website traffic due to increased shopping activity. Which scaling approach would be more appropriate to handle this surge in traffic efficiently? (2 Marks)
   a) Horizontal Scaling
   b) Vertical Scaling

4) Your company's database server needs help handling the increasing data volume as your business grows. Which scaling approach would you consider improving the database server's performance? (2 Marks)
   a) Horizontal Scaling
   b) Vertical Scaling

5) Your web application experiences periodic spikes in traffic during specific hours of the day, and you want to ensure consistent performance. Which scaling approach could help you maintain performance during peak hours while optimizing resource usage during off-peak hours? (2 Marks)
   a) Horizontal Scaling
   b) Vertical Scaling

6) What is the primary function of a web server in a client-server architecture? (1 Mark)
   a) Processing application logic and business rules.
   b) Serving static web content like HTML, CSS, and images to clients.
   c) Managing database connections and queries.
   d) Handling client authentication and user sessions.

7) Which of the following best describes the role of an application server in a web application stack? (2 mark)
   a) In serving web pages to clients.
   b) In Managing and executing application-specific logic and business processes.
   c) Routing network traffic between clients and servers.
   d) Caching and optimizing static web content.
8) In a typical web application architecture, where is the web server positioned relative to the application server? (2 mark)
   a) The web server and application server are the same.
   b) The web server is in front of the application server.
   c) The web server is behind the application server.
   d) The web server is unrelated to the application server.
9) You are designing an e-commerce website where user interface responsiveness and user experience are critical. Which design aspect should you focus on to ensure a smooth, engaging front-end experience? (2 mark)
   a) Backend database schema design
   b) Backend server performance optimization
   c) Front-end design and user interface (UI)
   d) Database indexing and query optimization
10) You are working on a healthcare management system where data security and compliance with patient privacy regulations are paramount. Which design aspect is most relevant to address these concerns? (1 mark)
   a) Front-end user interface design
   b) Backend server load balancing
   c) Backend database encryption and access control
   d) Front-end performance optimization
11) In Ruby, which of the following is not a valid variable name? (1 Mark)
   a) my_variable
   b) 123variable
   c) _variable
   d) Variable123
12) What is the primary purpose of the "puts" method in Ruby? (1 Mark)
   a) To read user input
   b) To display output to the console
   c) To define a method
   d) To perform mathematical operations

13) In Ruby, what data type is represented by the keyword "nil"? (1 Mark)
   a) Integer
   b) Boolean
   c) String
   d) No value (null)

14) What does the "elsif" keyword represent in an if-else conditional statement in Ruby? (1 Mark)
   a) It indicates the end of the statement.
   b) It specifies the default case.
   c) It introduces an additional condition to check.
   d) It is not a valid keyword in Ruby.

15) What is metaprogramming in Ruby primarily about? (2 Mark)
   a) Writing code that performs arithmetic operations.
   b) Writing code that modifies or generates code at runtime.
   c) Writing code that interacts with external databases.
   d) Writing code that handles user interface design.

16) In Ruby, what is the purpose of the "method_missing" method? (1 Mark)
   a) It defines a new method in a class.
   b) It handles calls to undefined methods at runtime.
   c) It provides access to metadata about a class.
   d) It allows direct access to class variables.

17) When might you use metaprogramming in Ruby? (1 Mark)
   a) To design user interfaces
   b) To optimize database queries
   c) To create dynamic methods and behaviours
   d) To manage external API calls

18) What does the command `rails generate model Product` do in Ruby on Rails? (1 Mark)
   a) Creates a new database table named "Product"
   b) Generates a new controller for the "Product" model.
   c) Creates a new model named "Product" with associated database migration.
   d) Adds a view for displaying "Product" details.

19) What role does the "routes.rb" file play in a Ruby on Rails application? (1 Mark)
   a) It contains application-specific environment variables.
   b) It defines the URLs and their mapping to controllers and actions.
   c) It is used for defining database tables and their relationships.
   d) It specifies the layout and design of the application's pages.

20) Which Rails command is used to run database migrations and apply pending changes to the database? (2 marks)
   a) rails server
   b) rails console
   c) rake db:migrate
   d) rake db:seed

21) Imagine you are developing a web service for a healthcare institution. The service will exchange patient's medical records between different hospitals and clinics. Considering the requirements for security, reliability, and ease of integration, would you choose SOAP or REST as the architectural style for this web service? Justify your choice based on the specific needs of the healthcare industry." (4 marks)

22) "Imagine you are a software architect working on a project for a popular e-commerce platform. The platform aims to provide customers with a seamless and user-friendly experience, allowing them to browse products, add items to their cart, and complete transactions. As the lead architect, describe how you would apply the principles of REST (Representational State Transfer) to design the web services for this e-commerce application. Discuss how you would structure resources, handle statelessness, and ensure scalability and maintainability while considering the complex interactions required by an e-commerce system." (4 marks)

23) What are the four HTTP verbs? (2 marks)

24) "You are tasked with developing a Ruby on Rails application for an online bookstore. Customers should be able to browse, search, and purchase books, while administrators can manage the inventory. Describe how you would design the database schema, models, and controllers to achieve this functionality efficiently. What would you consider ensuring a smooth user experience and effective inventory management?" (10 marks)