Mid-Semester Test
(EC-2 Regular)

Course No.   : SE ZG503
Course Title   : Full stack application development
Nature of Exam   : Closed Book
Weightage   : 30%
Duration   : 2 Hours
Date of Exam   : 22/09/2024 (FN)

No. of Pages	= 2
No. of Questions	= 5

Note to Students:
1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. All parts of a question should be answered consecutively. Each answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Q.1   Analyze if content delivery networks (CDNs) are suitable for the below scenarios. Provide valid justifications for why CDNs are suitable/not suitable.   [2*3=6]
   a) Consider a real-time stock market application that displays live prices of various stocks, bonds, and financial instruments. The stock prices are highly dynamic and are displayed based on market activity.
   b) Consider a video streaming platform like YouTube, Netflix, or a news website hosting a large video library. In this scenario, the platform needs to deliver video content (like movies, TV shows, or recorded news clips) to millions of users.

Q.2   Answer the below questions on HTTP status codes   [3*2=6]
   a) Explain situations where an API might return a "400 Bad Request" status code. Provide examples of what could cause this error.
   b) When should an API return a "401 Unauthorized" status code versus a "403 Forbidden" status code?
   c) What is the purpose of a "429 Too Many Requests" status code, and how should a client application handle it?

Q.3   Assume you are visiting a webpage with the following URL: [6]
http://www.website.com/products/electronics/laptops.html

The HTML document at this URL contains several hyperlinks. Determine the full URL to which the browser will navigate if the user clicks on each hyperlink immediately after the initial page download. Provide the full URL to which the browser will navigate and describe the browser's behavior for each link.

Link 1
a) What will the resulting URL be after clicking "Link 1"?

Link 2
b) What will the resulting URL be after clicking "Link 2"?

Link 3

c) What will the resulting URL be after clicking "Link 3"?

Link 4
d) What will the resulting URL be after clicking "Link 4"?

Link 5
e) What will the resulting URL be after clicking "Link 5"?

Link 6
f) What will the resulting URL be after clicking "Link 6"?

Q.4 Assess the efficiency of using WebSockets for real-time notifications in the social media app design. Consider scalability, user experience, network latency, and server resources. Suggest an alternative approach or technology and explain your choice based on the application's needs and potential future expansion if needed.   [5]

Q.5 You are developing a RESTful API for a Library Management System to manage books, authors, and library members. The API allows users to perform CRUD (Create, Read, Update, Delete) operations on various resources.
   a) As an API developer, identify the various API endpoints that will be required to support the following operations.   [5]

Operation	HTTP Verb	HTTP Status Code	API Endpoint
Get All Books			
Get a specific book by id			
Create a new book entry			
Update an existing book			
Delete a book by id			

   b) You need to add a new functionality that allows librarians to update only the availability status of a book (whether it is available, checked out, reserved, etc.) without affecting other attributes like title, author, or genre. The update should also record details like the timestamp of the status change and the librarian who made the update. Define the endpoint and specify the HTTP method. Describe the structure of request payloads and response objects in JSON format.   [2]

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