PG6100 Theory Mock Exam

The 10 questions in this mock exam are all worth the same. The questions are written in English. To answer these questions, it is preferred that you do it in English. However, any other language officially recognized by Westerdals (e.g., Norwegian) is obviously acceptable. Note: each question can be answered with just 1-2 paragraphs.

1) In HTTP 1.1, what is the difference between PUT and PATCH, and in which cases one should be used instead of the other?

2) Consider the following definitions of REST endpoints:

- GET   /product
    - o   (return all available products)
- GET   /product?k=v
    - o   (return all available products filtered by some custom query parameter)
- POST   /product
    - o   (create a new product)
- GET   /product/id/{id}
    - o   (return the product with the given id)
- GET   /product/id/{id}/price
    - o   (return the price of a specific product with a given id)
- DELETE   /product/id/{id}
    - o   (delete the product with the given id)

The design of such API has (at least) two clear problems, as not following best practices. Identify the problems, and explain why they are a problem.

3) In HTTP 1.1, explain what the 3xx status codes are used for. Describe two different examples in which you need two different 3xx status codes in a REST API.

4) You read a string from an external source (e.g., a file or a web service), which should contain the sentence "Jeg ønsker å oppnå en god karakter på denne eksamenen". However, when you display it (e.g., in a terminal or in a web page), you get "Jeg �nsker � oppn� en god karakter p� denne eksamenen". Speculate about what did happen, and explain in details why you get such string displayed wrongly in that way.

5) In JSON Merge Patch, assume a JSON resource being

{"a":1, "b":2, "c":null}

on which the following merge patch is applied

 {"b":null, "a":5}

What should be the final result of the resource after the merge?

6) Explain the main differences between a RESTful and SOAP web service. Speculate on why RESTful services are now more popular than SOAP ones.

7) Explain what HATEOAS is. Speculate on why it is not so common in practice (i.e., not so many systems use it).

8) Explain the main benefits (at least 2) and drawbacks (at least 2) of a Microservice architecture.

9) In the context of a Microservice architecture, explain what are the roles and benefits of API Gateways and Load Balancers.

10) In the context of distributed computing, explain what a Circuit Breaker is, how it works, and why it is useful.