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# CS808: Computer Security Fundamentals

## 4.12 Authentication and Authorisation Questions

### Question 1

- a) What are the three typical authentication factors?
- b) Provide an example authentication mechanism for each factor
- c) A friend has said that there is a system they use in which they provide two passwords; they claim this is two-factor authentication. Are they correct?

### Question 2

- a) Authentication systems do not typically store the password in the clear (i.e. in plain text), why?
- b) Why are secure hashes used to store passwords and how are they used to help verify that a user has provided the correct password?
- c) Explain how a password salt decreases the likelihood of a successful dictionary attack
- d) Why is it argued that information entropy is not a good measure of password security?

### Question 3

The University of Greater Glasgow has decided to implement a new password policy. It is as follows:

- Passwords should be a minimum of 6 characters long
- Passwords should have at least one uppercase letter
- Passwords should contain at least one number
- Passwords cannot be a minor adjustment of a previous password, e.g. if a prior password was alphabHet8 then alphabHet81 is not acceptable
- We will enforce password changes once every month

Analyse this password policy in terms of security and usability

### Question 4

The following represents logs collected from a web server. What observations can you make about them?

212.1.5.50 [11/2/17:18:46:59] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:18:47:29] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:18:47:52] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:18:48:05] "GET /exam.ps" user sec: password mismatch

[200 similar lines]

212.1.5.50 [11/2/17:19:32:49] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:19:44:00] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:19:45:02] "GET /exam.ps" user sec: password mismatch

212.1.5.50 [11/2/17:19:45:02] "GET /exam.ps" transfer ok

### Question 5

You are assessing a range of biometric readers. You have narrowed it down to two options.

Option A offers a False Acceptance rate of 0.10, and a False Reject Rate of 0.30

Option B offers a False Acceptance rate of 0.05 and a False Reject Rate of 0.40

Discuss which of these might be better and why.

## Question 6

Explain the Lampson model for access control. Provide an example subject, access request, and object for a website which allows patients to book an appointment with their GP.

## Scenario-based Questions

A hospital emergency department decides to digitise their patient records. Currently patient records are paper-based, and staff carry them around the hospital as necessary. The problem is that records are being left in rooms with patients, who can clearly see them. Also, records are being lost and are not always returned to the main storage cabinet. This means in emergency situations medical staff are unable to access the records as quickly as they need to.

The proposal is to place a computer device in each of the common areas (such as the waiting room and reception desk), as well as in each of the cubicles where patients are dealt with. The staff who need to access the records include administrators (who check patients in), nurses, and doctors.

An authentication mechanism needs to be selected for the devices. Consider each of the following questions, and propose a solution given an unlimited budget. You might need to do some research on the internet.

1. What should you consider when selecting an authentication mechanism for this scenario? What might the requirements be?
2. What options are available for authentication?
3. How does each option match your requirements?
4. Given your answers to the previous questions, which option would you choose and why?
5. Assume now that you have a smaller budget, what impact would this have on your choice?

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◀ [4.11: Video: Authorisation \(06:37\)](#)

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