GAC COMPUTING • EXERCISE SHEET

3.1 Front end, back end, and security

Name: _____ Class: _____ Date: _____ **Total: 12 marks**

KEY WORDS front end 前端 • back end 后端 • request 请求 • response 响应

Objective

Explain the front-end/back-end request-response model and protect secrets and enforced rules.

You must be able to:

- distinguish front end from back end
- describe a request and response
- decide which information and rules must stay on the server

1 Worked examples

■ Keep secrets off the page

The **front end** 前端 runs in the visitor's browser. The **back end** 后端 runs on a server controlled by the organisation. A browser sends a **request** 请求; the server returns a **response** 响应.

An API key, password, and database connection belong on the back end. Browser code is visible to every visitor. A rule such as "only enrolled students may download this file" must be enforced on the server.

2 Practice

2.1 State where front-end code runs. [1]

2.2 State what a server returns after receiving a request. [1]

2.3 Explain why an API key must not be placed in browser JavaScript. [2]

3 Exam-style questions

3.1 A course site checks in JavaScript whether a user is enrolled before showing a PDF link. Explain why this is not enough to protect the PDF. [4]

3.2 Recommend a secure request-response process for downloading the PDF. [4]

Solutions

2.1

- In the visitor's browser.

2.2

- A response.

2.3

- Browser code can be read by every visitor.
- The key could be copied and misused.

3.1

- A visitor can bypass or change browser-side JavaScript.
- They may find the PDF URL directly.
- The check is only a convenience, not enforced protection.
- The server must check enrolment before sending the file.

3.2

- The browser requests the PDF from a back-end route.
- The server checks the user's authenticated enrolment.
- If permitted, it returns the PDF response; otherwise it rejects the request.
- The secret data and enforced rule remain on the server.