



Strathmore
UNIVERSITY

STRATHMORE UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY
BACHELOR OF SCIENCE IN COMPUTER NETWORKS AND CYBERSECURITY
END OF SEMESTER EXAMINATION
CNS 2106 – INTERNET PROGRAMMING

DATE: 1st August, 2022

Time: 2 Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

QUESTION ONE

- a. In a HTML web page explain the use of the following elements; STRONG, PRE, P, BR, OL. **[5 Marks]**
- b. Explain and illustrate two the differences between GET and POST methods used in HTTP. **[2 Marks]**
- c. Cookies are information that browsers store on a client computer. Explain how the use of cookies is implemented on client computers and on web servers. **[4 Marks]**
- d. The HTTP request header has the CONNECTION attribute that can be set to OPEN or CLOSE.
 - i. State and explain design considerations for setting it to OPEN **[2 Marks]**
 - ii. How does setting the attribute to OPEN affect the capacity of HTTP API clients that connect to a cluster of servers for the same service? **[2 Marks]**
- e. For an organisation that uses web proxies, use a diagram to show and explain the exchange of HTTP requests and responses between clients and web servers when two clients (one after the other) request the same web page from a server **[8 Marks]**
- f. Use a diagram to describe how HTTP Content Distribution Networks (CDN) are used on Internet. **[7 Marks]**

(Total: 30 Marks)

QUESTION TWO

- a. You are required to build a web application for authenticating users by a user-name and password. Illustrate how you would achieve this with PHP sessions. Your answers should be in the form of a walkthrough with pseudo code of the application from the start of a session until when the user gets logged in. Assume that user login credentials are stored in a MySQL database. Note: You are not required to write a complete HTML and PHP application, but instead to explain what happens at every step of the application.
[8 Marks]
- b. You are required to design and develop a PHP web application that provides a URL redirection service. When a user enters a short URL in the browser the end result is the website located at a long URL is displayed. Your answer should be walkthrough of the applications whose data is stored in a MySQL database.
[7 Marks]
- (Total: 15 Marks)**

QUESTION THREE

- a. Explain the design of an API driven web application where users send requests to Web Server 1, which in turn sends a request over a REST API to a remote Web Server 2. Information is returned from Web Server 2 and then forwarded to the user.
[8 Marks]
- b. Given the following JSON message,
[
 {"name": "John", "id": "1"},
 {"name": "Martha", "id": "2"},
 {"name": "Lucy", "id": "3"}
]
- i. Show the corresponding decoded message with arrays and objects [3 Marks]
- ii. Explain using sample code how you would extract all values of *name* and *id* using PHP.
[4 Marks]
- (Total: 15 Marks)**

QUESTION FOUR

- a. Explain how a website can be configured to allow users from a given organisation's network to access and download PDF files, while requiring all other users to login with a user name and password.
[5 Marks]
- b. Describe the process that would be followed to configure a computer into a web server that supports a backend web development language e.g. PHP and a database e.g. MySQL. Your answer should give configuration settings, names of software applications or dependencies that are needed to get the web server working.
[10 Marks]
- (Total: 15 Marks)**

QUESTION FIVE

- a. Create a CSS class or element that can be used to format text as follows; bold, italic, underlined, blue text colour and yellow background colour. **[5 Marks]**

- b. You are given shown below that has three radio buttons named **education**, one of the buttons is labelled **university**, and has two child radio buttons named **level**. Create JavaScript code that activates 'level' buttons when the 'University' radio button is selected. When another 'education' radio button is selected the 'level' buttons are de-activated.

Your answer should show the HTML code of the form, and the JavaScript code. Sample HTML code is provided for you – you are only required to add code for one radio button and the javascript code.

HTML Page

Education Level

- ☒ Primary School
☐ High School
☐ University

University Education

- ☐ Undergraduate
☐ Postgraduate

Sample HTML code

```
<html>
  <head>
    <title>Java Script</title>
  </head>
  <body>
    <h1>Education Level</h1>
    <form>
      <input type="radio" id="pri" name="education"
        value="1">
      <label>Primary School</label><br>

      <input type="radio" id="hig" name="education"
        value="2">
      <label>High School</label><br>

      <input type="radio" id="uni" name="education"
        value="3">
      <label>University</label><br>

      <h2>University Education</h2>
      ...
      ...
      ...
    </form>
  </body>
</html>
```

[10 Marks]
(Total: 15 Marks)