



**Strathmore**  
UNIVERSITY

**FACULTY OF INFORMATION TECHNOLOGY  
BACHELOR OF SCIENCE IN COMPUTER NETWORKS AND CYBERSECURITY  
END OF SEMESTER EXAMINATION  
CNS 2106/BTC 3101: INTERNET PROGRAMMING**

DATE: 31 July, 2023

Time: 2 Hours

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**Instructions**

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

**QUESTION ONE**

- a. Explain the purpose and usage of HTML5, CSS3, and JavaScript in front-end web development. Describe how these technologies work together to create interactive and responsive web pages. **[5 Marks]**
- b. Using a signalling flow diagram, describe how the HTTP response code 301 can be used to support URL shortening or redirection service **[5 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. Using an example, explain the function of the ACCEPT attribute in the HTTP request header. **[2 Marks]**
- e. With the help of a diagram, describe the follow of requests and responses between two client computers, a HTTP proxy in the same organisation and a web server on the Internet when the clients are visiting the same public page **[6 Marks]**
- f. With respect to PHP sessions,
  - i. Explain the purpose and usage of PHP sessions. **[2 Marks]**
  - ii. Describe the flow of process from the start to the end of a session in PHP **[2 Marks]**
  - iii. Provide an example of setting and retrieving a session variable. **[4 Marks]**

**(Total: 30 Marks)**

## QUESTION TWO

- a. Explain the required attributes to use in an HTML document with the `<img>` tag and provide an example of how to display an image named "example.jpg" located in the same directory as the HTML file. [5 Marks]
- b. State the purpose of the HTML `<form>` element and provide sample code of a simple HTML form that includes text input, a checkbox, and a submit button. [5 Marks]
- c. Describe two ways of adding CSS in a HTML page and show an example. [5 Marks]

(Total: 15 Marks)

## QUESTION THREE

- a. Describe the purpose and usage of PHP's ***require*** and ***require\_once*** statements, and explain the difference between them? [5 Marks]
- b. With respect to PHP loops,
  - i. Using the following array, provide sample code that demonstrates how to use a foreach loop to iterate through the array and append the name of each fruit to the string "I like ".

`$fruits = ['Apple', 'Banana', 'Orange'];` [2 Marks]

- ii. Using the Array in (Q3b-i), create sample PHP code that uses a **WHILE** loop and terminates after displaying the word "Banana" [3 Marks]

- c. With respect to the PHP `$_SERVER[]` array,
  - i. Explain the role of the `$_SERVER['REQUEST_METHOD']` key in the `$_SERVER[]` array. [1.5 Marks]
  - ii. Describe the use of the `$_SERVER['HTTP_USER_AGENT']` key in the `$_SERVER[]` array. [1.5 Marks]
  - iii. Provide the key from `$_SERVER[]` that contains the client's IP address. [2 Marks]

(Total: 15 Marks)

## QUESTION FOUR

- a. Describe the purpose of JSON (JavaScript Object Notation) and explain two advantages over other data interchange formats. [4 Marks]
- b. Write PHP code to decode the following JSON string and access its elements.  
`$jsonString = '{"name": "John", "age": 25, "city": "New York"}'`

[3 Marks]

- c. Convert the given two-dimensional array into its equivalent JSON string representation.  
`$students = array( array('name' => 'John Doe', 'age' => 20, 'grade' => 'A'),  
array('name' => 'Jane Smith', 'age' => 22, 'grade' => 'B'));` **[3 Marks]**
- d. Explain the purpose and give two benefits of using Laravel as a PHP framework for web development. **[5 Marks]**

**(Total: 15 Marks)**

## **QUESTION FIVE**

- a. 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. **[5 Marks]**
- b. Describe the process of creating and installing self-signed ssl/tls certificates for apache2 web server on Linux. **[5 Marks]**
- c. Describe how to configure apache authentication using *mod\_auth*. **[5 Marks]**

**(Total: 15 Marks)**