



**Strathmore**  
UNIVERSITY

SCHOOL OF COMPUTING AND ENGINEERING SCIENCES  
BACHELOR OF SCIENCE IN INFORMATICS AND COMPUTER SCIENCE  
END OF SEMESTER EXAMINATION  
ICS2101: WEB APPLICATION DEVELOPMENT

DATE: 27<sup>th</sup> July 2022

Time: 2 Hours

**Instructions**

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

**Question One (30 marks)**

- a. In a web application, a web client sends a web request to a web server. Suppose you searched the URL [www.google.com](http://www.google.com), from your Mozilla browser, list the name-pair contents of this web request, that will be present in the request header.
- (3 marks)**

- b. Consider the following output rendered on screen, consisting of a **<h2>** heading and a paragraph.

**My heading**

**L**orem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor invidunt ut labore et dolore magna aliquyam erat, sed diam voluptua. At vero eos et accusam et justo duo dolores et ea rebum. Stet clita kasd gubergren, no sea takimata sanctus est.

Duis autem vel eum iriure dolor in hendrerit in vulputate velit esse molestie consequat.

- i. Write CSS code that will be used to display the **first letter** of a **paragraph** directly following a **<h2>** as follows: **(5 marks)**

- o Black background
- o White font color
- o A border edges curving at 2px
- o Size of font is 250%

- ii. Consider the following HTML code applied to the anchor tags. **(2 marks)**

**HTML Code**

```
<a href="#">Home Page</a>
<a href="#">Contacts Page</a>
```

- Write CSS code that will render the following output on the screen, using a browser.

[♥Home Page](#) [♥Contacts Page](#)

- c. Consider the following HTML and CSS code below, and answer the questions that follow:

**HTML CODE**

```
<!DOCTYPE html>
<html>
<head>
  <title>Scene</title>
  <link rel="stylesheet" type="text/css" href="scene.css">
</head>
<body>
  <h1>Scene</h1> <h1>#7</h1>

  <div id="a">Elizabeth: Captain Barbosa, I am here to negotiate
  the cessation of hostilities against Port Royal.
  </div>

  <div>Barbosa: There are a lot of long words in there, Miss.<br />
  What is it that you want?
  </div>

  <div class="b">
    <div class="c">Elizabeth: I want you to leave</div>
    <div class="c">and never come back.</div>
  </div>

  <div class="c" id="d"> Barbosa: I'm disinclin to acquiesce
  to your request. Means &quot;no.&quot; </div>

</body>
</html>
```

## CSS CODE

```
//CSS CODE

#a { border: 2px solid black;
    float: left;
    padding-right: 3em;
    width: 33%; }

div{
    border: 2px solid;
}

.a #a { background-color: yellow; }

.b div { display: inline; }

.b, .c { text-decoration: underline; }

.b > .c { background-color: yellow; }
```

- i. Draw a picture of how the following HTML/CSS code will look when the browser renders it on-screen. Assume that the HTML is wrapped in a valid full page with a head and body. Indicate a non-white background by shading lightly or by drawing

this

diagonal lines like . It is possible that some CSS rules shown will not apply to any elements. *Assume that the screen is the size of your answer booklet*

**(10 marks)**

- d. Consider the following form:

Enter the first Number :

Enter the second number:

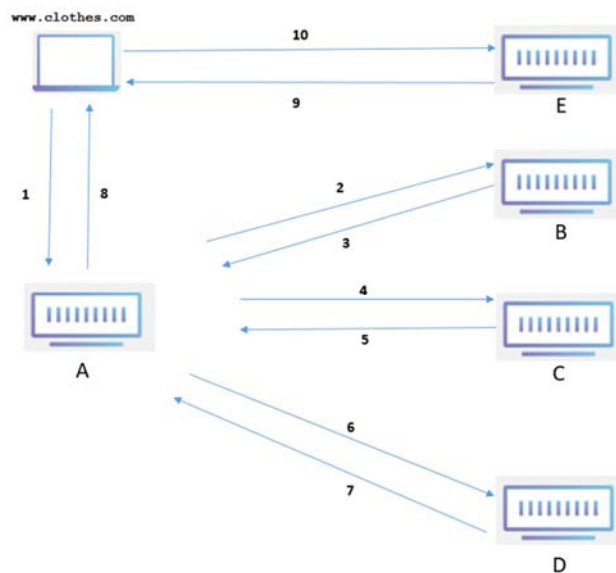
- i. Using HTML and CSS create a form that takes two numbers from user as input . The input collected should be sent to a page named “*calculate\_product.php*” , using the HTTP POST method **(5 marks )**
- ii. Using PHP *create a function* that accepts two numbers as arguments, and calculates the product of the two numbers entered by the user. **(4 marks)**

- iii. Output the result on the screen as follows : “The product of number1 and number2 is X”  
(1 mark)

### Question Two (15 marks)

As a web- application student, you have been tasked to create an e-commerce web application ([www.clothes.com](http://www.clothes.com)) shop for an online clothes shop. The application will be used by users to make orders online.

- a. As a web developer draw a picture to indicate how you would design the landing /index page of the online application  
(5 marks )
- b. Suppose a user would like to purchase clothes from your ecommerce shop, and has visited the website for *the first time*.
- Describe steps that will be taken for the web client to communicate with the webserver.  
(4 marks)
  - Consider the diagram below, label all servers that will be used to ensure communication between the web client and the web server  
(2 marks)



- c. Explain why we frequently end up validating input in a web app twice: once in browser and then again in the web server.  
(2 marks)

- d. If you resize a modern web app in a window, it is not unusual to see it just shrink to fit in the smaller window but if you make the window small enough it will reorder the layout on the app to better work in the small window. Explain the browser's mechanism that web app used to have this behavior. (2 marks)

**Question Three (15 marks)**

- a. Consider the following HTML/CSS code.

**HTML CODE**


```
<div>
  <span>A</span>
  <div id="div">B B</div>
</div>

<span class="div">C C C</span>

<div>
  <div class="div">D D D D </div>
  <div id="span">E E E E E </div>
  <div class="span">F F F F F F</div>
</div>
```

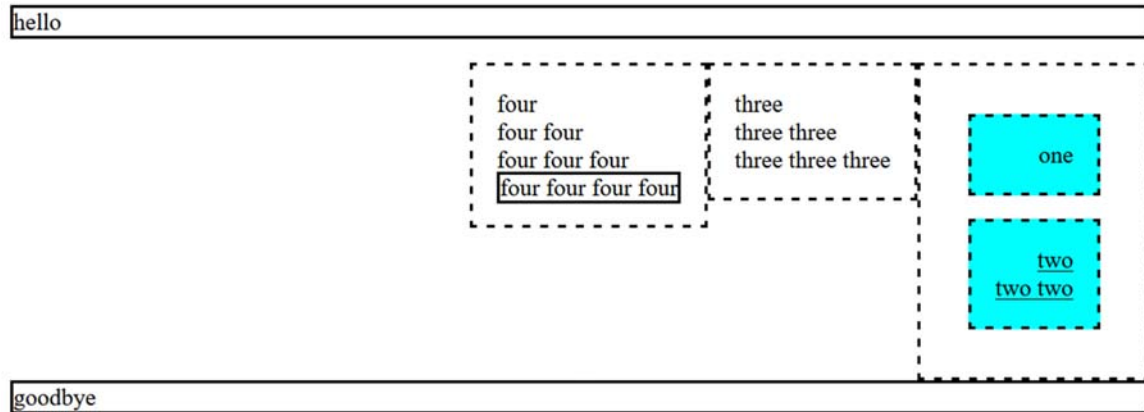
**CSS CODE**

```
div { border: 2px solid black; padding: 1em; }
body > div { margin: auto; width: 50%; }
div #div, p { background-color: yellow; text-decoration: underline; }
span div, span.div { border: 2px dashed black; }
div > div.div { float: left; }
#div, .span { clear: left; }
span#span { background-color: yellow; }
```

- i. Assume that HTML is wrapped within the head and body. Draw a picture of how the HTML/CSS code will appear when browser displays it on the screen. Indicate non-white background by drawing diagonal lines like . Some rules may not apply. (10 marks)
- b. What is the difference between HTTP and HTTPs (2 marks)
- c. When you visit a website, your browser sends a request to the web server to obtain data or information from it, e.g. an HTML file (i.e. a web page).
- i. Suppose you request for a page eg [www.strathmore.edu](http://www.strathmore.edu), using Mozilla web browser, write the possible HTTP contents of the HTTP Request (Indicate the contents as name-value pairs) (3 marks)

#### Question Four (15 marks)

- a. Consider the following output. You have been provided with the HTML code used in this output



#### HTML CODE

```
<p> hello </p>

<div>
  <div> one </div>
  <div id="div"> two <br /> two two </div>
</div>

<div class="div"> three <br /> three three <br /> three three three </div>
<div class="div"> four <br /> four four <br /> four four four <br />
  <span class="div"> four four four four </span>
</div>

<p> goodbye </p>
```

#### Description

- All paragraphs have a solid black border with a thickness of 2px
- All div tags have a dashed black border, with a thickness of 2px
- All div tags that are children of the body tag float to the right

- o The elements with a "one", "two", "two two" have a background color of cyan and aligns text to the right.
- o The elements with "two" and "two two" are underlined
- o The element with "four four four four" has a solid black border, 4px thick

i. Write CSS code that is necessary to create the above appearance on screen. **You are not allowed to modify the HTML.** (10 marks)

b. Consider the following form, whereby the input fields which accept text only inputs have been disabled:

Billing address

Same as shipping address: ☒

- i. What are the properties of a disabled element? (2 marks)
- ii. Write CSS code that will be used to give all disabled, text inputs, a background color of "#ccc" (3 marks)

### Question Five (15 marks)

a. Consider the following HTML form that exists orders.php for ordering clothes online.

☐ Shirts x \$3.50

☐ Trouser x \$40.00

Shipping:

☐ Regular (\$7)

☐ Express (\$9)

☐ Donate \$5 extra?

#### HTML CODE

```
<form action="process_order.php" method="post">

<div>
```

```

        <input id="input1" type="text" name="shirts" size="2" /> Shirts x $3.50
    </div>
    <div>
        <input id="input2" type="text" name="trouser" size="2" /> Trouser x $40.00
    </div>

    <div>Shipping: <br />

    <label><input id="input4" type="radio" name="shipping" value="regular" /> Regular ($7)</label>
    <br />
    <label><input id="input5" type="radio" name="shipping" value="express" /> Express ($9)</label>

    </div>
    <div>
        <label><input id="input3" type="checkbox" name="donation" /> Donate $5 extra?</label>
    </div>
    <div><input id="input6" type="submit" value="Buy" /></div>

</form>

```

- i. Write a PHP function that calculates the total cost of the order. Each shirt costs \$3.50 and each trouser costs \$40.00. There is a shipping cost added to the total, which is either \$7.00 for regular shipping or \$9.00 for express shipping. The user can optionally check the donation box and add \$5.00 to the total cost of the order .  
(6 marks)
- ii. Write code that will display a h2 heading “*Your order*”, followed by the pictures of the number of shirts or trousers the user has ordered.  
(5 marks)
- iii. Write code that will be used to print out the total cost of the order with the message “*Thank you for your order*”. If the user makes a donation also print out the message, “*Thank you for your donation*”  
(4 marks)