(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY REGULAR EXAMINATIONS 2023/2024 ACADEMIC YEAR

SECOND YEAR 2ND SEMESTER EXAMINATIONS

BACHELOR OF SCIENCE COMPUTER SCIENCE

COURSE CODE: BCS 223
COURSE TITLE: WEB PROGRAMMING

DATE: THURSDAY 18TH APRIL, 2024 **TIME:** 11:30AM – 1:30 PM

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE (1)** and Any **OTHER 2** questions
Ensure your answers/ideas are clearly expressed
All your answers must be clearly numbered
Write in ink. Rough work can be done (in answer booklet) in pencil and will not be marked. Cross out any rough work.
Calculators, phones, tablets, computers not allowed

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 05 Printed Pages, including cover page. Please Turn Over.

QUESTION ONE: COMPULSORY [30 MARKS]

a) You are assigned to create a simple web application for a library management system using HTML forms. The system should allow librarians to manage books by adding, updating, and deleting book records. Implement the following functionalities

i) Design an HTML form for adding new books to the library. Include input fields for the following book attributes: (Don't add any styling).The form should be processed using GET method. [6 Marks]

- Title
- Author
- ISBN
- Genre
- Publication Year

ii) Implement client-side validation using JavaScript to ensure that all required fields are filled out before submitting the form. Display appropriate error messages if any field is left blank [6 Marks]

iii) Develop an HTML table to display the list of existing book records. Include columns for Title, Author, ISBN, Genre, Publication Year, and Actions (Edit/Delete). [6 Marks]

iv) Add functionality to the table rows to allow librarians to edit or delete individual book records. Clicking the "Edit" button should populate the book information back into the form for editing. [6 Marks]

v) Create a PHP script (add_book.php) to process the form submission. Validate the form data on the server-side to ensure data integrity and prevent injection attacks. [6 Marks]

QUESTION TWO: [15 MARKS]

a) Consider the following HTML code for a personal Blog:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width,
initial-scale=1.0">
  <title>Personal Blog</title>
  <link rel="stylesheet" href="styles.css">
</head>
<body>
  <header>
    <h1>My Personal Blog</h1>
    <nav>
      <ul>
        <li><a href="#">Home</a></li>
        <li><a href="#">About</a></li>
        <li><a href="#">Contact</a></li>
      </ul>
```

```
    </nav>
  </header>
  <section class="main-content">
    <article>
      <h2>First Blog Post</h2>
      <p>Lorem ipsum dolor sit amet, consectetur
adipiscing elit. Nullam auctor velit nec magna
posuere...</p>
    </article>
    <article>
      <h2>Second Blog Post</h2>
      <p>Sed do eiusmod tempor incididunt ut labore et
dolore magna aliqua. Ut enim ad minim veniam...</p>
    </article>
  </section>
  <footer>
    <p>&copy; 2024 My Personal Blog. All rights
reserved.</p>
  </footer>
</body>
</html>
```

i) Use CSS to style the following components of the web page (styles.css): [10 Marks]

- Set a background color for the header and footer.
- Style the heading (h1) in the header to have a larger font size and center it horizontally.
- Style the navigation (nav) to display its list items (li) horizontally.
- Set different background colors for odd and even articles in the main content section (section.main-content).
- Style the footer to have a smaller font size and center its content horizontally.

ii) Implement responsive design using CSS media queries to adjust the layout for smaller screens. Ensure that the navigation collapses into a hamburger menu when viewed on smaller screens [5 Marks]

QUESTION THREE: **[15 MARKS]**

a) You are tasked with enhancing a simple web page using JavaScript. Implement the following functionalities using JavaScript:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
```

```
    <meta name="viewport" content="width=device-width,
initial-scale=1.0">
    <title>JavaScript Web Page</title>
    <link rel="stylesheet" href="styles.css">
</head>
<body>
    <header>
        <h1>JavaScript Web Page</h1>
        <button id="toggleButton">Toggle Background
Color</button>
    </header>
    <section class="main-content">
        <p>This is a sample paragraph. Click the button
above to toggle the background color of the header.</p>
    </section>
    <footer>
        <p>&copy; 2024 JavaScript Web Page. All rights
reserved.</p>
    </footer>
    <script src="script.js"></script>
</body>
</html>
```

Use JavaScript to implement the following functionalities (script.js):

i) Add an event listener to the button with the id toggleButton. When clicked, toggle the background color of the header (<header>) between two predefined colors (e.g., light blue and light gray). [6 Marks]

ii) Ensure that the text on the button updates dynamically to reflect the current action (e.g., "Toggle Background Color" when the background is light blue and "Toggle to Gray" when the background is light gray). [4 marks]

iii) Implement a countdown timer that starts from 10 seconds when the page is loaded. Display the remaining time in seconds in the footer (<footer>) of the page. Update the timer every second and stop it when it reaches zero. [5 Marks]

QUESTION FOUR: **[15 MARKS]**

a) You are working on a project that requires validating user input for a registration form. One of the requirements is to validate the strength of the user's password. The password must meet the following criteria: [7 Marks]

- At least 8 characters long.
- Contains at least one uppercase letter.
- Contains at least one lowercase letter.
- Contains at least one digit.

- Contains at least one special character (e.g., !, @, #, $, %, ^, &, *).

Write a JavaScript function named validatePassword that takes a password as input and returns true if the password meets all the criteria mentioned above, and false otherwise.

b) A dynamic web form can allow users to add and remove input fields for their skills. Each input field represents a skill that the user possesses. Write a jQuery function named manageSkills that adds and removes input fields for skills dynamically based on user interaction. [8 Marks]

QUESTION FIVE: **[15 MARKS]**

a) Write a PHP function named validateAndStoreEmail that takes an email address as input, validates it, checks if it already exists in the database, and stores it if it passes validation and is unique. [6 Marks]

b) Write a PHP script to sort the following associative array by the value of the "age" key in descending order: [3 Marks]

```
$people = array(
    array("name" => "John", "age" => 30),
    array("name" => "Alice", "age" => 25),
    array("name" => "Bob", "age" => 35)
);
```

c) Write a PHP script to generate and display a list of prime numbers between 1 and 100. Prime numbers are numbers greater than 1 that have no positive divisors other than 1 and themselves [3 Marks]

d) Write a PHP function named reverseString that takes a string parameter and returns the reverse of the input string. For example, if the input is "hello", the function should return "olleh". [3 Marks]