



Open University *of* Mauritius

BSc (HONS) COMPUTER SCIENCE [OUbs033]

EXAMINATION FOR: June - July 2023

MODULE : Server Side Web Technologies [OUbs033211]

DATE : Tuesday 20 June 2023

DURATION : 2 Hours

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **FOUR (4) QUESTIONS**.
2. Answer **All questions**.
3. Always start a new question on a fresh page.
4. Total marks: **100**

This question paper contains 4 questions and 7 pages.

ANSWER ALL QUESTIONS

QUESTION 1 [25 MARKS]

Suppose you are an IT consultant for a small business that wants to create a new website. The business is a coffee shop that wants to allow customers to browse their menu, order online, and make reservations. They have asked for your expertise to help them understand how client-server architecture, web protocols, web browsers, web servers, ISPs, and search engines work.

a) Identify and explain **four (4)** web protocols that will be used in the website design. For each protocol, explain its function and how it contributes to the website's functionality.

(4 marks)

b) Explain the process of how a web browser retrieves information from a web server.

(5 marks)

c) Describe **three (3)** functions of a web server in the context of the coffee shop website.

(3 marks)

d) Explain how an ISP plays a role in accessing the coffee shop website.

(3 marks)

e) Assume you are designing a website for a local coffee shop. The website has a navigation menu with links to different pages, and each link should change color when the user hovers over it.

Write a CSS code snippet that implements this hover effect, using the following specifications:

- The background color of the link should change to a light blue (#ADD8E6) when the user hovers over it.
- The text color of the link should change to white when the user hovers over it.
- The hover effect should be applied to all links in the navigation menu.

Your code snippet should be written in **three (3)** different styles: inline, internal, and external, and should be properly labeled to indicate which style is which.

(10 marks)

QUESTION 2 [25 MARKS]

You are a developer tasked with building a dynamic web application for a retail company that sells products online. The application will allow users to browse and purchase products, as well as manage their orders and account information. Your team has decided to use server-side scripting and technologies to build the application. You have been asked to design and implement the backend of the application using Java, Perl, PHP, ASP, ColdFusion, Ajax, jQuery, and CGI.

a) Briefly explain the concept of server-side scripting and its importance in web application development.

(5 marks)

b) State the main features of each of the following server-side scripting languages: Java, Perl, PHP, ASP, and ColdFusion. For each language, provide an example of a web application that could be developed using it.

(5 marks)

c) Describe how CGI (Common Gateway Interface) works and its role in server-side scripting and. Describe the steps involved in a typical CGI request/response cycle.

(5 marks)

d) The team has written a PHP script that processes a user's login request and authenticates them against a MySQL database. The script uses encryption to protect the user's password and set a session variable upon successful authentication.

The team has no such experience in coding and has left mistakes in the following snippet of codes.

You are required to write **ONLY** the **MISSING** PHP codes (line 2, 3, 4, 5, 12, 13, 22, 31, 32, 34) for successful testing of the authentication, encryption and connection to the database.

(10 marks)

01	<?php
	// Set up database connection
02	
03	
04	
05	
06	\$conn = mysqli_connect(\$db_host, \$db_user, \$db_pass, \$db_name);
	// Start session
07	session_start();
	// Check if form has been submitted
08	if(isset(\$_POST['submit'])) {
	// Sanitize and store user input
09	\$email = mysqli_real_escape_string(\$conn, \$_POST['email']);
10	\$password = mysqli_real_escape_string(\$conn, \$_POST['password']);
	// Encrypt password
11	\$encrypted_password = password_hash(\$password, PASSWORD_DEFAULT);
	// Query database for user
12	
13	
	// Check if user exists
14	if(mysqli_num_rows(\$result) == 1) {
	// Get user's data
15	\$row = mysqli_fetch_assoc(\$result);
16	\$db_password = \$row['password'];
	// Verify password
17	if(password_verify(\$password, \$db_password)) {
	// Set session variable
18	\$_SESSION['user_id'] = \$row['id'];
	// Redirect to dashboard
19	header("Location: dashboard.php");
20	exit();
21	} else {
	// Invalid password
22	
23	}} else {
	// User does not exist
24	echo "User does not exist.";
25	}} ?>
26	<!DOCTYPE html>
27	<html> <head> <title>Login</title> </head> <body>
28	<h1>Login</h1>
29	<form method="post" action="<?php echo \$_SERVER['PHP_SELF']; ?>">
30	<label>Email:</label>
31	
32	
33	<input type="password" name="password" required>
34	
35	</form> </body> </html>

QUESTION 3 [25 MARKS]

Suppose you are developing a web application for a company that wants to keep track of its employees' attendance. The company wants to collect and store the IP4 address of each employee when they log in to the application, use cookies to remember their login session, and use SQL to store the attendance data in a database. They also want to use AJAX to display the attendance data in real-time to the HR department, and to automate the attendance taking process using a Perl script.

a) What is an IPv4 address and why is it important for the attendance system of this company?

(3 marks)

b) How can you retrieve the IPv4 address of a user who logs into the web application using PHP?

(3 marks)

c) Explain how cookies work and why they are necessary for this attendance system.

(5 marks)

d) Write a PHP function that sets a cookie to remember a user's login session.

(4 marks)

e) Write a SQL query that inserts attendance data into a table named "attendance" with columns "employee_id", "date", and "status".

(5 marks)

f) Explain what AJAX is and how it can be used to display attendance data in real-time to the HR department.

(5 marks)

QUESTION 4 [25 MARKS]

A web development company has been tasked with building a web application for an e-commerce business. The web application needs to be secure and user-friendly, and must use jQuery for dynamic content and interaction.

a) Explain the importance of web application security and identify some common security risks that web applications face.

(5 marks)

b) How can jQuery be used to enhance the security of a web application? Provide examples.

(5 marks)

c) The form below represents a web page which allows the user to record client's details of queries issued by administrators. On submission of the form, the data is further processed by the script *myclient.php*.

Client Details E-Commerce

JUNE/JULY 2023

Contact Date :

Client Id :

First Name :

Last Name :

Gender : Male ☒ Female ☐

Preferences: Other Particulars:

Administrator : ☐ Above Client's info is correct

Figure 1:

query.html

- **Additional Information**

1. Set id and name of Contact Date textbox to *dtecontact*,
2. Set id and name of client Id textbox to *txtCID*,
3. Set id and name of First Name textbox to *txtFname*,
4. Set id and name of Last Name Textbox to *txtLname*,
5. Set name of Gender radio button to *rdoGender* and values 'M' for Male and 'F' for Female,
6. Drop down (name & id of Preferences set to *sltpreferences*) containing the following: *First Row (value=Books)*, *Second Row (value=Car)* and *Third Row (value=Clothing)*,
7. Set id and name of other particulars textbox to *txtother*,
8. Set id and name of visitor officer checkbox to *chkofficer*,
9. Button *Submit Form* submits data to the *myclient.php* via the *POST* method.

Write the HTML5 codes for *query.html* (as shown in Figure 1) taking into consideration the above information. *You may assume that NO table tag has been used in this form.*

(15 marks)