TUNKU ABDUL RAHMAN UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

ACADEMIC YEAR 2024/2025

OCTOBER EXAMINATION

<u>BMIT2013 WEB-BASED INTEGRATED SYSTEMS</u>

MONDAY, 21 OCTOBER 2024   TIME: 2.00 PM – 4.00 PM (2 HOURS)

BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN SOFTWARE SYSTEMS
DEVELOPMENT

Instructions to Candidates:

Answer **ALL** questions. All questions carry equal marks.

Question 1

a) A functional web-based system is developed by integrating different client-side and server-side web technologies together:
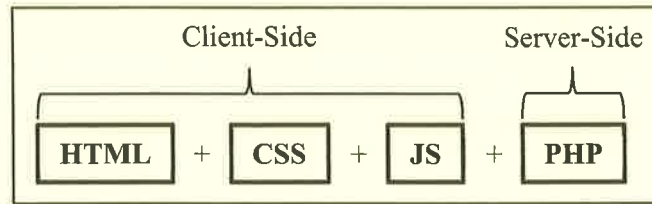

Figure 1: Different web technologies

Identify the full name and main role for each of the **FOUR (4)** web technologies as shown in **Figure 1**. In addition, give a usage example for each of them. (10 marks)

b) Distinguish between **GET** and **POST** request methods. In addition, categorise the following database operations to either **GET** or **POST** request method respectively:

- SELECT
- INSERT
- UPDATE
- DELETE

NOTE: <u>NOT</u> required to mention how these request methods can be triggered. (8 marks)

c) Interpret the HTTP status text and meaning for each of the following HTTP status codes:

(i) 404 (2 marks)

(ii) 500 (2 marks)

d) Investigate the reason why server-side processing has a slower response compared to client-side processing. (3 marks)

[Total: 25 marks]

Question 2

a) Compare and contrast between static web pages and dynamic web pages. (10 marks)

b) Within a web-based system, a targeted resource (such as a web page or an image) can be linked and referenced by using either absolute path or relative path.

(i) Differentiate between absolute path and relative path. (6 marks)

This question paper consists of 4 questions on 5 printed pages.

Question 2 b) (Continued)

(ii)   Analyse the file and folder structure of a web-based system as shown in **Figure 2**:
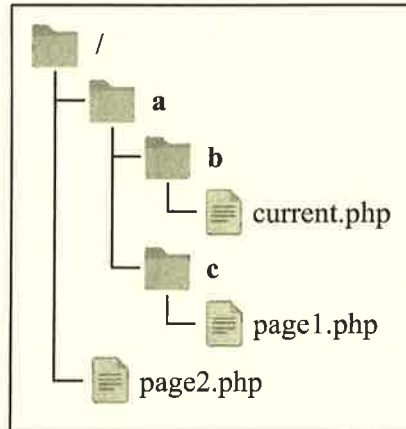

Figure 2: File and folder structure

Given that the current page is **current.php**, identify the relative path to each of the following pages:

- **page1.php**
- **page2.php**   (2 marks)
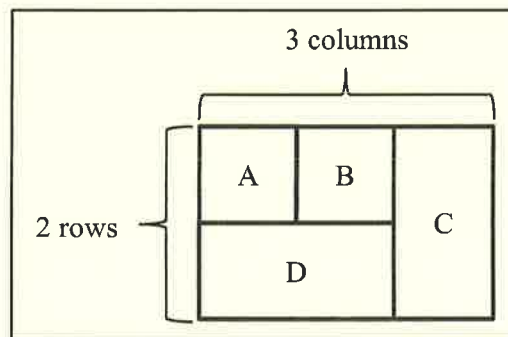
c)   Analyse the HTML table structure as shown in **Figure 3**:

Figure 3: HTML table structure

Write HTML codes to construct the table by using the following elements and attributes:

- Elements: **table, tr** and **td**.
- Attributes: **rowspan** and **colspan**.

NOTE: CSS is <u>NOT</u> required.   (7 marks)

[Total: 25 marks]

Question 3

student			Sample Data:
PK	**id**	CHAR(4) NOT NULL	S001, S002
	name	VARCHAR(100) NOT NULL	Alice, Bob
	gender	CHAR(1) NOT NULL	F, M
	cgpa	DECIMAL(5, 4) NOT NULL	3.5000, 3.8500

Figure 4: Structure of the **student** database table

Assume that you are developing the "Insert Student" page, which contains an HTML form to capture and submit user inputs. With reference to **Figure 4**, answer the following questions:

a)   Identify the most appropriate HTML input control for each of the following fields:

   NOTE: Code examples are <u>NOT</u> required.

   (i)   The **Name** field. (1 mark)

   (ii)   The **Gender** field. (1 mark)

   (iii)   The **CGPA** field. (1 mark)

b)   Apart from ensuring the inputs are required (filled and not empty), identify additional input validations for each of the following fields:

   (i)   **TWO (2)** additional input validations for the **Id** field. (2 marks)

   (ii)   **ONE (1)** additional input validation for the **Name** field. (1 mark)

   (iii)   **ONE (1)** additional input validation for the **Gender** field. (1 mark)

   (iv)   **TWO (2)** additional input validations for the **CGPA** field. (2 marks)

c)   Given that **$_db** is a PDO object which has been initialised with the relevant parameters. Write PHP statements to perform each of the following database operations:

   (i)   SELECT all student records. Store the result in the array **$arr**. Utilise the **query()** and **fetchAll()** methods in your solution. (4 marks)

   (ii)   INSERT a student record. Assume that the inputs have been captured, validated and stored in the variables **$id, $name, $gender** and **$cgpa**. Utilise the **prepare()** and **execute()** methods in your solution. (6 marks)

d)   Recommend any **THREE (3)** practices to improve database security. (6 marks)

[Total: 25 marks]

Question 4

a)   Distinguish between the following **THREE (3)** methods of adding CSS to web pages:

- Inline CSS
- Embedded CSS
- External CSS

NOTE: Code examples are <u>NOT</u> required.   (9 marks)

b)   PHP supports both cookie and session as state management mechanisms to address the stateless nature of the HTTP communication protocol.

   (i)   Examine any **THREE (3)** differences between cookie and session.   (6 marks)

   (ii)   Identify **TWO (2)** use cases for cookie and session respectively.   (4 marks)

c)   Differentiate between authentication and authorisation in the context of web-based system security, with appropriate examples.   (6 marks)

[Total: 25 marks]