2023 Databases and the Web Exam

Question 1

a: Answer the following based on the below HTML/CSS code

```
<html>
<head>
    <meta charset="UTF-8"/>
    <title>HTML example</title>
    <style>
        p {font-style: italic;}
        div {width: 50vw;}
        div.b {margin-left: auto;}
    </style>
</head>
<body>
    <span>
        <div class="a">A</div>
        <div class="b">B
            <div class="c">C</div>
            <div class="d">D</div>
        </div>
            <div class="e">E</div>
    </span>
    <div class="container">
        <p>COMP3230</p> <p>Exam</p>
    </div>
</body>
</html>
```

(i) Show the output of this code as you would see on a web browser. [12 marks]

A

B
C
D

E

COMP3230

Exam

Figure 1: Question1 1a Answer

(ii) Write a CSS rule to change the colour of all paragraph (<p>) descendants of div with class "container" to blue. [2 marks]

```
.container p {
    color: blue;
}
```

(b) Briefly explain the difference between inline and block-level HTML elements, and show an example of each. [6 marks]

Inline elements:

- Inline elements do not start on a new line and only take up as much width as necessary. **Basically, when they are used, they can occur on the same line as other text that's already there**
- They allow other elements to sit beside them horizontally.
- Examples of inline elements include `<span>`, `<a>`, `<img>`, `<strong>`, `<em>`, `<input>`, etc

Example:

```
<p>This is an <strong>inline</strong> element.</p>
```

Block-level elements:

- Block-level elements always start on a new line and take up the full width available, pushing subsequent elements onto new lines.
- They create a "block" of content.
- Examples of block-level elements include `<div>`, `<p>`, `<h1>` to `<h6>`, `<ul>`, `<ol>`, `<li>`, etc.

Example:

```
<div>This is a <p>block-level</p> element.</div>
```

Question 2

(a) JavaScript variables can have global or local scope. Briefly explain what each one of these two means

Global and local scope refers to the accessibility of variables within a JavaScript program.

- Global variables can be accessed from anywhere within the program, including functions, blocks, and nested loops.
- Local variables have a much more limited scope from which they can be accessed or used. They can only be accessed within a function, or a specific block of code, meaning other parts of the programs will not be able to use them.

(b) You have the following JavaScript function

```
function checkSpeed(temp){
    if (temp > 70)
        speed = "over the limit";
    if (temp > 40)
        speed = "slow down";
    if (temp > 0)
        speed = "tortoise";
    else speed = "stuck in traffic";

    return speed;
}
```

What would the above function return in the following three cases:

(i) checkSpeed(80); [2 marks]

tortoise

(ii) checkSpeed(55); [2 marks]

tortoise

(iii) checkSpeed(0); [2 marks]

stuck in traffic

(c) Function showResult takes input mark, and shows an alert box with message Pass if the mark is at least 40, otherwise Fail. If the mark is negative or greater than 100, the message is Not a valid mark

Someone attempted to implement the function showResult in JavaScript, as shown below:

Line 1 function showResult(){
Line 2 if (mark<0 OR mark >100){
Line 3 alert(“Not a valid mark”);
Line 4 } else if (>=40){

Line 5 alert(“Pass”);
Line 6 else {
Line 7 alert (Fail);
Line 8 }
Line 9 }

However, there are 5 errors in the above code. For each error you identify, write down the line number and the correct version. [10 marks]

Errors in code:

- “OR” should be replaced by “||”
- Needs a finishing curly bracket after the else if statement, because it’s missing it
- The alert for the else statement needs to have quotation marks
- The variable mark isn’t ever brought into the function, which would mean that there’s nothing to test
- The else if statement logic isn’t correct. It have the word mark inside of it, and be written like this:

```
else if (mark >= 40)
```

Question 3

(a) An associated array named scores is used to record the team and score on a Sunday rugby match as given below

```
$scores = array(
    "Exeter"=>42, "Gloucester"=>76, "Sale"=>34,
    "Bristol"=>67, "Leicester"=>52, "Bath"=>28,
    "Newcastle"=>84, "Worcester"=>61);
```

(i) Here is a section of PHP code to list on a web page the teams in the array $scores who have obtained a score over 40:

```
foreach (scores as $team and $score) {
IF ($score = 40) {
echo "<p>$name</p>",
]
}
```

However, there are errors in the code. Identify the errors and write down the correct version. [6 marks]

- The if statement should use a lower case if
- The square bracket should be replaced with a curly bracket
- In the foreach, scores should have a $ at the front of it
- It should have a => instead of and, as this indicates the key and value pairing of both
- It should echo $team, instead of $name, which hasn't been identified
- It should use == instead of =, as we're comparing values, not assigning values

(ii) Write a PHP statement to record in the array $score the score 58 of the team Northampton. [2 marks]

```
$scores["Northampton"] = 58;
```

(iii) Write a PHP statement to print out the total number of teams in the array $scores. [2 marks]

```
$totalTeams = count($scores);
echo "Total teams: " . $totalTeams";
```

(b) A PHP script on the site `www.travel.com`, named script.php outputs a specific journey on request. The script is accessed after the user has entered a ID number and destination letter on a form. The user's browser requests the script using a URL similar to the one below:

```
http://www.travel.com/script.php?ID=3&destination=b
```

(i) Is this an example of passing data to the PHP script using the HTTP GET or the HTTP POST method? [2 marks]

GET

In the URL `http://www.travel.com/script.php?ID=3&destination=b`, the data (ID and destination) is included in the URL itself as query parameters after the ? symbol. This is characteristic of the GET method, where data is appended to the URL as key-value pairs in the form of query parameters.

In contrast, the HTTP POST method sends data in the request body rather than as part of the URL.

The POST method wouldn't change the appearance of the url.

(ii) What single line of PHP code, if contained within script.php would place the ID number into a PHP variable named $ID_number? [2 marks]

```
$ID_number = $_GET["ID"];
```

(c) What is a cookie? Explain how could a web site use a cookie to track whether or not a user is logged in. [6 marks]

A cookie is a small piece of data that a website sends to a user's browser and saved there. The website is then able to access the data on this cookie, and send the data back with each request. This may be useful for remembering a user's preference on a website, as well as whether a user is logged in. If the user is logged in, then different/additional layouts to the page may be shown.

Question 4

(a) Consider the SQL code below. You need to understand what the queries are doing and write down the results. Be aware that not all queries written here are correct

```
CREATE TABLE Author(
authorID INT PRIMARY KEY,
surname CHAR(255),
firstName CHAR(255));

CREATE TABLE Presentations(
presentationID INT PRIMARY KEY,
date DATE NOT NULL,
location CHAR(255),
authorID INT,
FOREIGN KEY (authorID) REFERENCES Author(authorID));

INSERT INTO Author VALUES(1,'Novikova','Julia');
INSERT INTO Author VALUES(2,'Netrebko','Anna');
INSERT INTO Author VALUES(3,'Terfel','Bryn');
INSERT INTO Author VALUES(4,'Terfel','Bryn');
INSERT INTO Author VALUES(2,'Kauffmann','Jonas');

INSERT INTO Presentations VALUES (3, '2023-01-04','Salzburg',1);
INSERT INTO Presentations VALUES (30, '2023-01-04','London',2);
INSERT INTO Presentations VALUES (31, '2023-01-01','Salzburg',1);
```

(i) Write down the contents of the two tables that have just been created. [10 marks]

Author table:

authorID	surname	firstName
1	Novikova	Julia
2	Netrebko	Anna
3	Terfel	Bryn
4	Terfel	Bryn

(note: attempting to insert Kauffmann into the Author table with the ID of 2 will cause an error, as this ID is already in use)

Presentations Table:

presentationID	date	location	authorID
3	023-01-04	Salzburg	1
30	2023-01-04	London	2
31	2023-01-01	Salzburg	1

(ii) How many presentations by Julia Novikova are recorded in the database? [1 mark]

There are two presentations presented by Julia Novikova.

(iii) Write the output from the following query:

```
SELECT COUNT(*) FROM Author WHERE firstName='Anna'
```

COUNT(*)
1

```
COUNT(*)
--------
1
```

(basically it would show just a table with the header COUNT(*), and then underneath it show the value of 1, given that "Anna" only appears once in the table)

(iv) Write down the output from the following query:

```
SELECT location FROM Presentations; [2 marks]
```

[2 marks]

```
location
---------
Salzburg
London
Salzburg
```

(basically it would show just a table with the header location, and then underneath it show all the locations specified from the Presentations table)

(v) Assume you issue the following command:

```
INSERT INTO Presentations VALUES (39, '2023-02-02','London',3);
```

Now write down the result from the following query.

```
SELECT * FROM Author a WHERE EXISTS(SELECT authorID FROM
Presentations WHERE authorID=a.authorID AND location='London' );
```

[5 marks]

authorID	surname	firstName
2	Netrebko	Anna
3	Terfel	Bryn