COS10011 COS6004 COS60007

Creating Web Applications

Revision Exam

The final exam consists of:

Section A: Multiple-choice questions.

Worth between 20% and 30% of the final exam
Usually about 20-30 questions.
Similar in style to those you completed in your weekly quizzes.
Quizzes and their answers are made available under the Revision menu on Blackboard.
Use to revise your knowledge.

Section B: Short answer multi-part questions

Worth between 70% and 80% of the exam.
On the following topics areas:
1. HTML
2. CSS
3. JavaScript / DOM
4. PHP / MySQL

Each of these topic areas are worth between 10% and 20%.

For COS60007 students, there will be additional questions about Database design worth about 10%.

This paper provides sample short answer questions on each these topics.

Question 1: HTML   (20 marks)

Consider the HTML page below. It is displayed in the Firefox browser and has not had any CSS or JavaScript applied to it.

Write HTML that would display this page.
The HTML should be both HTML5 and XML compliant.

The webpage should:
- Use appropriate names for the form control fields.
- Have the HTML check box checked by default.
- Must have the Name and Student Id fields completed before submission.
- Does not allow no more than 10 characters in the student ID field.
- Should comply with accessibility principles, for images and foems, (eg.by linking all labels explicitly to the form controls.)
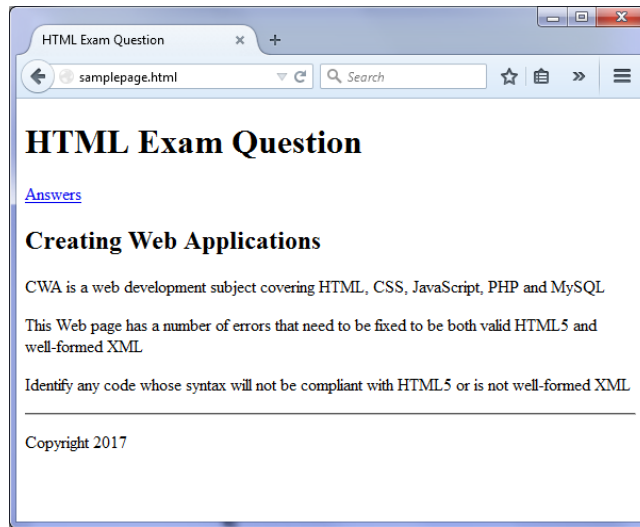
Other details:
- The image is called `logo.png`, is in the same folder as the html, and does not need resizing.
- The form is sent using a POST http message to "https://mercury.swin.edu.au/helpdesk.php"

Question 2: HTML   (10 + 2 + 2 + 2 + 4 = 20 marks)

Q2a.
Consider the HTML page:

The following HTML code is supposed to produce the above output, and be both valid HTML5 and well-formed XML. But it has **10** syntax errors in it (ignoring any cascading errors.)
Circle these errors on the code below, then on the next page, list the line number, explain the error and write what the correct syntax should be.
(Note: An element with misnamed start and end tags counts as one error)

```
1       <DOCTYPE html5>
2       <html lang=en>
3       <head>
4               <title>HTML Exam Question</title>
5               <meta charset="utf-8"/>
6               <meta name="description" content="Code with HTML errors">
7       </head>
8       <body>
9               <head>
10                <h1>HTML Exam Question</h1>
11              </head>
12              <navigation>
13              <p><a link="answers.htm">Answers</p></a>
14              </navigation>
15              <article>
16                      <h2>Creating Web Applications</h2>
17                      <p>CWA is a web development subject covering HTML, CSS,
                        JavaScript, PHP and MySQL</p>
18                      <p>This Web page has a number of errors that need to be fixed
                        to be both valid HTML5 and well-formed XML</p>
19              </article>
20              <aside>
21                <p>Identify any code whose syntax will not be compliant with HTML5
                     or is not well-formed XML
22              </aside>
23              <footer>
24                      <br>
25                      <p>Copyright 2017</p>
26              </footer>
27      </body>
28      <html>
```

(Q2a continued) For each error, identify the line number(s), explain the error, show how to fix it.　　(10)

Line Number(s)	Error / fix

Q2b. Write the HTML code that would link this HTML file to an external CSS style sheet called `question2.css` ?　(Assume that the CSS is in the same directory as the HTML page that references it.)

(2)

- -

Q2c. Write the HTML code that would link this HTML file to an external JavaScript file called `question2.js` ?　(Assume that the JavaScript file is in the same directory as the HTML file.)　(2)

- -

Q2d. What attribute is added to an image element to improve accessibility?   (1)

Write a link with such an attribute to an image file called `question2.png`. ?
(Assume that the image is in the same directory as the HTML page that references it.)   (1)

Q2e. Describe the exchange of HTTP messages between a client and a server where a Web form is
displayed to a user, then after it is filled in the data in the form is sent to the server, and then processed
by a PHP script that returns an acknowledgement on a Web page.   (4)


Question 3: CSS   (6 + 3 + 1 + 4 + 2 = 16 marks)

Consider the following snippet of validated HTML5 code and the styled output shown below:

```html
<h1>Style Sheet Example</h1>
<nav>
    <ul>
        <li><a href="#typography">Text</a></li>
        <li><a href="#layout">Layout</a></li>
    </ul>
</nav>
<section id="typography">
    <h2>Text Formatting</h2>
    <p class="keypoint">Styles allow complex formatting to be applied without
    changing the document's HTML code.</p>
    <p>You can see by this example that certain text formatting has been achieved that
would be impossible to create using standard HTML tags. However, the person who styled
this page needs to improve the colour coordination! </p>
</section>
<aside>
    <p class="keypoint">Styles are flexible and powerful</p>
    <p>Styles therefore not only provide maintenance benefits to developers
        but provides additional formatting opportunities.</p>
</aside>
<section id="layout">
    <h2>Page Layout</h2>
    <p class="keypoint">Styles also enable effective page layout.</p>
    <p>The CSS boxes can resize and flow with the page. Margins, borders, and padding
    can be used to create the optimal layout and separation of page elements. </p>
</section>
<footer>
    <p>Copyright 2013</p>
</footer>
```
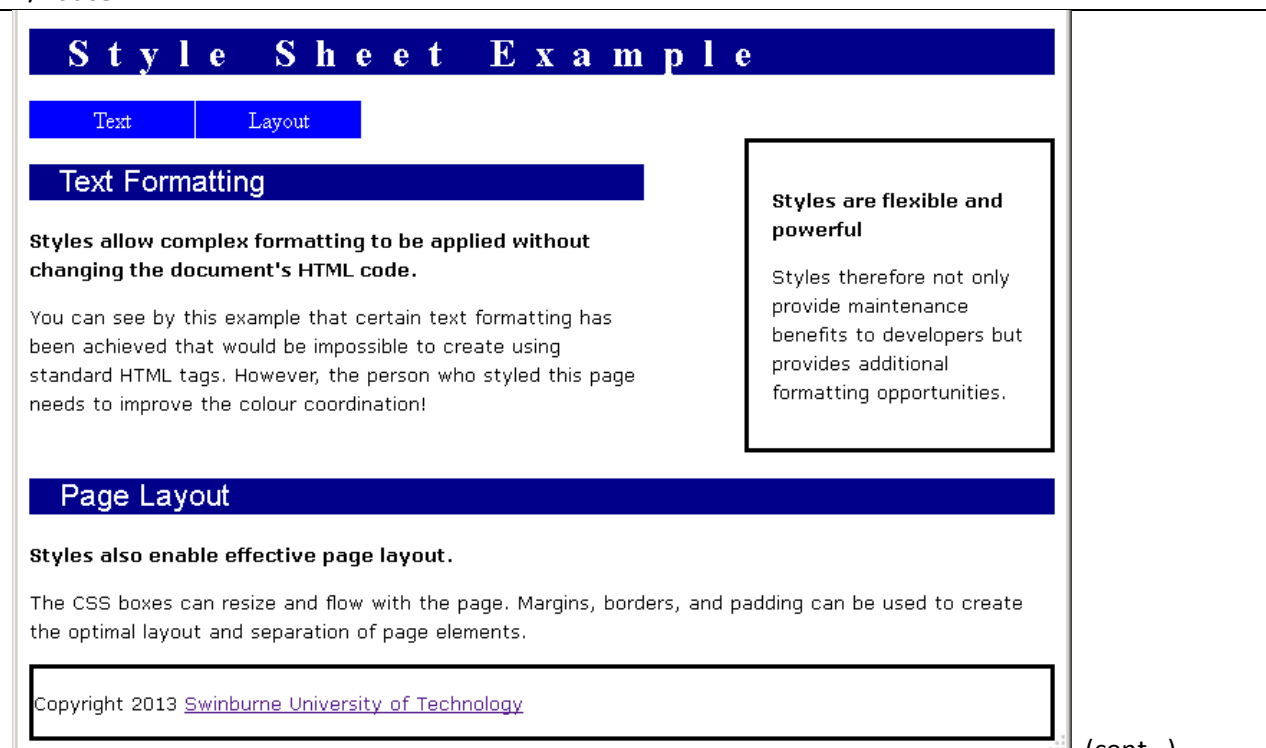
Q3a. Below are some of the CSS rules has been developed with the aim of producing the above browser output. However there are 6 errors. Circle these errors on the code below.   **(6)**

```
1      #keypoint {
2        font        : bold;
3      }
4
5      typography {
6            float        : left;
7            width        : 60%;
8      }
9      #layout {
10           float        : left;
11     }
12
13     #ul {
14
15           width            : 100%;
16           padding          : 0;
17           margin           : 0;
18           list-style-type : none;
19     }
20     nav, a {
21           float             : left;
22           width            : 6em;
23           text-decoration  : none;
24           text-align       : center;
25           text-color        : white;
26           background-color : blue;
27           padding          : 0.2em 0.6em;
28           border-right     : 1px solid white;
29     }
30     a:hover {
31           background-color : #2288ff;
32     }
```

For each error, identify the line number(s), explain the error, show how to fix it..

Line Number(s)	Error / fix

Q3b. Write a rule that positions the **<aside>** box where it is on the screen with the border as shown. Assume the width of the aside box is 25%. **(3)**

Q3c. In the nav <element> rule, what is the purpose of the following line?

```
text-decoration  : none;
```
(1)

Q3d. Describe the difference between a *pseudo element* and a *pseudo class* in CSS. Give an example of each. **(4)**

Q3f. Examine the following snippet of HTML code and the resulting web page:

```
<ol id="alist">
  <li>Banana</li>
  <li>Apples:
    <ol>
       <li>Granny Smith</li>
       <li>Jonathan</li>
    </ol>
  </li>
  <li>Pear</li>
</ol>
```
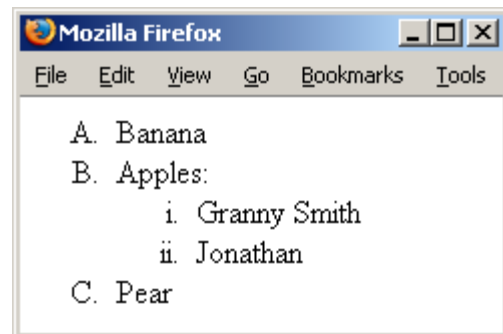
The properties used to format the lists as above are:
```
list-style-type: upper-alpha and
list-style-type: lower-roman
```

Write two CSS rules that could produce the page shown above for that particular list. **(2)**

Question 4. JavaScript and DOM   (10 + 2 + 2 + 6 = 20 marks)

Q4a.   **(10)**

Consider the following form and the associated snippet of HTML code below.

```
...
<form id="regForm" method="post" action="form_process.php" >
        <p><label for="owner">Owner&apos;s Name</label>
        <input type="text" name= "owner" id="owner" />
        </p>
        <p><label for="age">Age (years)</label>
          <input type="text" name= "years" id="age"/>
        </p>
        <p><label for="male">Male</label>
        <input type="radio" id="male" name="gender" value="male"/>
        </p>
        <p><label for="female">Female</label>
        <input type="radio" id="female" name="gender" value="female"/>
        </p>

        <input type= "submit" value="Register"/>
        <input type= "reset" value="Reset Form"/>
</form>
```
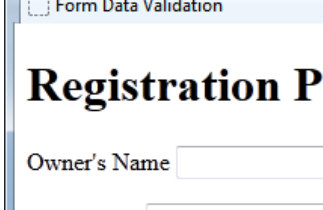
Firefox ▾ — Form Data Validation

Registration Page

Owner's Name [   ]

Age (years) [   ]

Male ○

Female ○

[Register] [Reset Form]

Write a JavaScript function "checkForm()" to validate the data entered in the form.
The function should check that :
- All fields are not empty
- The name is no more than 40 characters
- The age is a number between 1 and 100

If there are errors, show a single alert box with all messages combined.
Return true if the form data is okay, or false if the form values are not okay.

Q4b.   **(2)**
If the function is in an external JavaScript file called `question3.js,` what line would need to be written into the HTML to link to the JavaScript.

Assume that the HTML file is in the web site **root** directory and that the JavaScript file is in a directory called **/scripts**.

Q4c.   **(2)**
Write the initialization code that would ensure the checkForm( ) function is called when the "Register" form is actioned.

Q4d.   **(6)**
Write a JavaScript function "convertScore" that takes a numeric score as a parameter and returns a descriptive mark based on the range provided below:

0 to below 50	Fail
50 to below 60	Pass
60 to below 70	Credit
70 to below 80	Distinction
80 to 100	High Distinction

If the input is not a number between 0 and 100 then an empty string is returned.

Question 5. PHP and MySQL   (10 x 2 = 20 marks)

Complete the following PHP script using PHP's MySQL functions.

The following code is from a file named `show.php` that is used to open a database named s1234567_db, in order to display all the team profile information from a "`teams`" table.

- A connection to the server is made and stored in variable `$dbConnect`
- A query on the database is made to retrieve all records from the "teams" table and store the result object in a variable named `$storedData`
- Each row is then read from `$storedData` into `$row` and output to a HTML table.

Some code lines are missing or incomplete in this file that enables the data to be assigned to an associative array, then displayed in the code fragment below.

Using PHP (not object oriented) code and all defined variables, **complete the lines labelled q5a-e**. Do not include error checking techniques such using `die()` or `exit()`.

```
        $dbName = "s1234567_db";
        $host = "feenix-mariadb.swin.edu.au";
        $user = "s1234567";
        $pword = "ddmmyy";
```

Q5a.   `$dbConnect =` _____ ;

Q5b.   `$sqlQuery =` _____ ;

Q5c.   `$storedData =` _____ ;

```
        echo "<table>";
```

Q5d.   `while ($row =` _____ `){`

```
                echo "<tr><td>", $row["team_id"], "</td>";
                echo "<td>", $row["team_profile"] , "</td>";
                echo "<td>", $row["team_password"] , "</td></tr>";

        }
        echo "</table>";
        mysqli_free_result ($storedData);
```

Q5e.   _____ ;

Q5f.   Write a query string that will insert into a "member" table the field values stored in variables $member and $password. The field names of the "member" table are member_name and member_password.

Q5g.   Write a query string that will delete the member record from the "member" table having member_name equal to the string value stored in variable $member.

Q5h.   Write the query string that will delete all records from the "member" table.

Q5i.   Write the query string that will select all member records from the "member" table.

Q5j.   Write the query string that will update the member password in the "member" table.
The "member" table has two fields namely member_name and member_password. The value in member_password is to be replaced with the value stored in the string variable $password, and the member name of the record to be updated must match the string value stored in variable $member.

Question 6. Database (COS60007 students only)   (4 + 1 + 1 + 1 + 6 = 10 marks)

Q6.1   (4)

Consider the following:
1. Each company operates four departments, and each department belongs to one company.
2. Each department in in part (a) employs one or more employees, and each employee works for one department.
3. Each department has one Head of Department who is also an employee.
4. Each of the employees in part (b) may or may not have one or more dependents, and each dependent belongs to one employee.

Draw an Entity-Relationship Diagram in UML notation to represent the above entities and the relationships with their cardinalities.

Q6.2   (1)

Circle the correct answer. To change an un-normalised relation to 1st Normal Form you must:

  a. Remove all Part Key Dependencies
  b. Remove all Non-Key Dependencies
  c. Remove all Functional Dependencies
  d. Remove all Multiple Value cells

Q6.3   (1)
What is the best primary key for this relation?

Computer Owner	Serial Number	CPU type
Bob Jeffries	112	Pentium 4 dual core
Bronwyn Bishop	114	Pentium 4 dual core
Bronwyn Bishop	98	ARM 1176
Carl Reitman	111	68000
Wendy Carlos	99	ARM 1176

  a. Computer Owner
  b. Serial Number
  c. Computer Owner + Serial Number
  d. CPU Type

Q6.4   (1)

What is a "surrogate key"

Q6.5   (6)

A Tennis club has asked you to create a database which stores and displays bookings for tennis courts. A member is only allowed to book one court at a time.

You have been provided with the following sample information:

Member Surname	Member Firstname	Member Number	Booking Date	Booking Time	Court	Duration (hours)	Payment ($)
Smith	John	12123	22/06/15	14:00	1	1	10
Brown	Dave	23234	14/11/15	19:30	1	2	15
Jones	Sue	4576	14/12/15	10:00	1	1	10
Smith	John	12123	12/01/15	14:00	2	1	6.50
Brown	Dave	4567	12/01/15	14:00	1	1	0
Jones	Sue	4576	22/06/15	14:00	2	1	6.50
Davis	Eric	4312	No bookings yet				

Write the relational schema for this data **in 3NF.** Show which columns are Primary keys (PK) and which are Foreign keys (FK). Add any surrogate keys you think are necessary.

Hint: you will end up with at least 3 tables.
Remember, a relational schema looks like this:
TABLE1(PrimaryKey, column1, column2, Column3…)
TABLE2(KeyAttribute1+KeyAttribute2, column1, column2, Column3…)