ICT286 Web and Mobile Computing

Sample Exam Paper

Time Allowed**: 2 hours plus 10 minutes reading time**

INSTRUCTIONS

1. There are 16 pages in this Paper, including 3 blank pages at the end.
2. The questions are divided into two parts worth a total of 100 marks.
3. Part I consists of 30 multiple-choice questions, worth 1 mark each and 30 marks in total.
4. Part II consists of 6 questions, worth 70 marks in total.
5. For questions in Part I, mark your answer to each question in the Computer Answer Sheet (not on this Question Book). You must use a blue or black pen, not a pencil, to mark your choice.
6. For questions in Part II, write your answer directly on this Paper in the space below each question.
7. If more space is required, continue your answer on the blank pages at the end.
8. Make clear on the original page that your answer is to continue on a blank page and give the page number.
9. Use the back of each page for rough notes if required.

Your Name: _____

Your Student Number:_____

Your Signature:_____

EXAMINATION AID ALLOWED

Provided by the University

Nil

Provided by the Candidate

Closed Book Examination – No Calculators Permitted

Part I. Multiple-Choice Questions (1 mark x 30 = 30 marks). Mark your answer to each question in the Computer Answer Sheet (***not** on this Question Book)*. You must use a blue or black pen, not a pencil, to mark your choice.

1. Which of the following statements about the Internet is *false*?
   a. All machines on the Internet have a unique IP address.
   b. All machines on the Internet have a unique port number.
   c. All machines on the Internet communicate using TCP/IP.
   d. There are high-level application services on the Internet.

2. XHTML forms are mainly used to
   a. display forms.
   b. draw GUI components such as buttons and text boxes.
   c. generate tables.
   d. collect user inputs.

3. For the following CSS rule:

   ```
   ol p { margin-left: 0ex; text-align: left;}
   ```

   which of the following statements is true?
   a. The CSS rule applies to both `<ol>` and `<p>` elements.
   b. The CSS rule applies to `<ol>` elements first then to `<p>` elements.
   c. The CSS rule uses a generic selector.
   d. The CSS rule uses a contextual selector.

4. The official name of the standard JavaScript is
   a. JavaScript
   b. JScript
   c. LiveScript
   d. ECMAScript

5. Which one of the following statements about client-side JavaScript is true?
   a. JavaScript is compiled inside the web browser.
   b. JavaScript variable names are not case-sensitive.
   c. JavaScript can access XHTML elements via DOM.
   d. JavaScript is interpreted on the server-side.

6. Which of the following is *not* a primitive data type in JavaScript?
   a. Number
   b. String
   c. Char
   d. Null

7. Which one of the following statements about JavaScript arrays is *false*?
   a. All array elements must be of the same type.
   b. Arrays can be declared with the reserved word new.
   c. You can expand an array by adding elements past the array length.
   d. An array may contain holes, i.e., some array elements may be undefined.

8. Which of the following is *not* a method of the JavaScript object `Window`?
   a. write.
   b. open.
   c. blur.
   d. close.

9. Which of the following is *not* a method of the JavaScript object `Document`?
   a. write.
   b. open.
   c. prompt.
   d. close.

10. Which of the following is *not* a property of the JavaScript object `Document`?
   a. forms.
   b. plugin.
   c. images.
   d. lastModified.

11. Which of the following JavaScript objects would you use to obtain the name and version number of the browser that is running the JavaScript?
   a. Date.
   b. Window.
   c. Document.
   d. Navigator.

12. The following is a JavaScript regular expression:

```
/(^-?\d\d*$)/
```

   What does it describe?
   a. The string `"(^-?\d\d*$)"`.
   b. A random string.
   c. A number.
   d. An integer.

13. Which of the following is *not* a valid HTTP method?
   a. GET
   b. DELETE
   c. SEND
   d. OPTIONS

14. Web browsers use the following HTTP header to negotiate content type with the web server:
   a. Content
   b. Content-Type
   c. Accept
   d. Reject

15. Which one of the following statements about PHP is *false*?
   a. A PHP script runs on the server computer.
   b. Once received from the web server, the PHP script can be viewed from the web browser.
   c. The reserved words and function names in PHP are case-insensitive.
   d. Variable names in PHP must begin with the dollar sign $.

16. What would the following PHP statements produce?

```
$nothing;
if ($nothing)
    echo "Nothing";
else
    echo "Something";
```

   a. The string "Nothing".

b. The string "Something".
c. An error message.
d. Nothing will be produced.

17. In PHP, you can open the file `data.txt` for reading and writing with the following statement:

```
a.  $fd = fopen("data.txt", "r");
b.  $fd = fopen("data.txt", "r+");
c.  $fd = fopen("data.txt", "w");
d.  $fd = fopen("data.txt", "a");
```

18. In PHP, the function `feof($fd)`, where `$fd` is a file handle, returns true when
    a. the file is empty.
    b. the file is not empty.
    c. the read and write pointer is at the beginning of the file.
    d. the read and write pointer is at the end of the file.

19. Which of the following statements about cookies is true?
    a. A cookie is created by the web client and is sent to the web server.
    b. Cookies are dangerous because they allow web servers to steal private information from the web clients.
    c. The purpose of cookie is to allow the web client to remember the previously visited web pages.
    d. The purpose of cookie is to allow the web server to remember the web client that had previously visited the web page.

20. Consider the following PHP excerpt:

```
<?php  setcookie ('lastaccess', $today, time()+600); ?>
```

    How long will the cookie stay on the client's machine?
    a. 600 days.
    b. 600 hours.
    c. 600 minutes.
    d. 600 seconds.

21. In PHP, what is the preferred way of obtaining a cookie named `User` that is sent by the web client?
    a. Using `$User`
    b. Using `$COOKIE`
    c. Using `$COOKIE["User"]`
    d. Using `$_COOKIE["User"]`

22. Given the following SQL statement

```
SELECT CustNo, CustName
   FROM Customer
     WHERE (CustName LIKE 'S%') AND (CustNo <= 500);
```

    Which of the following statements best describes the records that this SQL statement will retrieve?
    a. CustName for all customers whose names contain letter S and CustNo of all customers whose CustNo are no more than 500.
    b. CustName for all customers whose names begin with S and CustNo of all customers whose CustNo are no more than 500.

c. CustName or CustNo for all customers whose names begin with S and whose CustNo are no more than 500.
d. CustName and CustNo for all customers whose names begin with S and whose CustNo are no more than 500.

23. Which of the following is *not* a MySQL command?
a. `JOIN command.`
b. `ALTER TABLE command.`
c. `INSERT command.`
d. `DELETE command`

24. Given the following PHP excerpt:

```
$scores = array(1=>75, 2=>50, 3=>100);
$scores[] = 60;
```

What would be the content of the array `$scores` after the above statements are executed?
a. 60.
b. 60, 60, 60
c. 1=>75, 2=>50, 3=>100, 4=>60.
d. 1=>60, 2=>75, 3=>50, 4=>100.

25. Given the following PHP excerpt:

```
$scores = array(75,50,100,60);
$x = array_shift($scores);
array_unshift($scores, 25);
```

What would be the content of the array `$scores` after the above statements are executed?
a. 75, 50, 100, 60
b. 75, 50, 100, 25
c. 25, 50, 100, 60
d. 50, 100, 60, 25

26. How would you obtain the name of the server running the PHP script?
a. Using variable `$SERVER`
b. Using `$SERVER["SERVER_NAME"]`
c. Using `$_SERVER["SERVER_NAME"]`
d. There is no way to get the server name in PHP.

27. Symmetric Cryptography means that
a. the key used to encrypt messages is symmetric, like "ada".
b. the key used to encrypt messages is symmetric to the key used to decrypt the messages.
c. the key used to encrypt messages is also used to decrypt the messages.
d. the encryption software and decryption software must be the same.

28. Which of the following is *not* a common digest function?
a. MD4.
b. MD5
c. SHA.
d. DSS.

29. Which of the following statements about Ajax is *false*?
a. Ajax becomes famous partly due to Google Map and Gmail.
b. To update a web page using Ajax, the whole document needs to be retrieved.

c. With Ajax, client requests are handled asynchronously.
d. Ajax is not a new programming language.

30. Which of the following is the object we use today to implement Ajax application?
    a. XHMLHTML.
    b. XMLHttpRequest
    c. XmlDocument
    d. Dojo

Part II There are 6 questions in this part, with a total of 70 marks. Write your answer to each question directly in the space under the question.

1. (10 marks) There are two methods by which the user input collected from an HTML form can be sent to the server script for processing.

    a) What are these two methods?

    b) Use an example to explain the differences between the two methods, as well as the pros and cons of the two methods.

    c) For each of the two methods, provide an example request message that delivers the data to the server.

2. (10 marks) Explain what an HTTP cookie is and what one could achieve by using cookies in a website. Use a PHP example to demonstrate how one may set a cookie and use it for a useful purpose.

3. (10 marks) Assume that you have an account on a MySQL server running on the same machine as the web server. Your username and password for the account are “joe” and “abc” respectively. The only database in your account is named “mydb” and your database is populated with a table named “Customers” which has the following three columns: `CustNo` (the primary key), `CustName`, and `CustPhone`. Answer the following questions:

   a) (2 marks) Give the PHP code to connect to the database.

   b) (2 marks) Assume that you have connected to the database, give the PHP/SQL code that searches the database for the name of the customer whose customer number 100.

   c) (6 marks) Give the PHP/SQL code that researches the database for the names and phone numbers of those customers whose names start with the letter T, and print out resulting names and phone numbers.

4. (10 marks) Given the following HTML code contains three p elements:

```
<h3 class="red"> Three lines </h3>
<p class="red"> this is line 1 </p>
<p id="slide"> this is line 2 </p>
<p> this is line 3 </p>
```

write jQuery code so that

- when the first p element is clicked, its background colour changes to red.
- when the second p element is clicked, the line slides up.
- when the third p element is clicked, its text changes to "jQuery".

Note that 1) you must not change the above HTML code, and 2) you must use ***three different kinds*** of selectors to select these three p elements

5. (10 marks) The following sub-questions are related to Public Key Cryptography.
   a) Describe, with the help of an example, how Public Key Cryptography works.
   b) Describe how the digital envelope works.
   c) Describe how the digital signature works.

6. (20 marks) This question consists of two sub-questions related to Apache Cordova programming.

Given the following *incomplete* Cordova mobile application whose www directory contains the following HTML file "index.html":

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="user-scalable=no,
       initial-scale=1, maximum-scale=1,
       minimum-scale=1, width=device-width">
    <title>A Mobile App</title>
</head>
<body>


    <!--  Section A -->


    <script src="cordova.js"></script>
    <script src="js/index.js"></script>
</body>
</html>
```

The JavaScript file "js/index.js" in the above code is listed below:

```
var app = {
    initialize: function() {
        this.bindEvents();

        // Section B
    },

    bindEvents: function() {
        document.addEventListener('deviceready',
                this.onDeviceReady, false);

        // Section C

    },

    onDeviceReady: function() {

        // Section D
    },

    // Section E
};

app.initialize();
```

5.1. (15 marks) Complete the above Cordova application by filling appropriate code in Section A to Section E, such that

a) When the user clicks a button, it displays the following mobile device information: model, operating system and OS version.

b) When the user clicks another button, it takes a picture using a device camera.

c) When the orientation of the mobile device changes, it displays its acceleration (*without* using a dialog or pop-up).

Note: if you do not remember the name of any JavaScript or Cordova function, you may use your own notation for that function in your program and provide a note explaining the purpose and the required arguments of that function.

5.2. (5 marks) Provide a sequence of Cordova CLI commands that would build and run the application on an Android simulator and a browser.

(Continue your answer on the next page if more space is required)

(Continue your answer on this page if more space is required)

END OF QUESTIONS

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