

PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY  
DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE  
SECOND SEMESTER EXAMINATIONS - 2021  
THIRD YEAR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

**CS320 – INTERNET PROGRAMMING (II)**

**TIME ALLOWED: 3 HOURS**

**INFORMATION FOR CANDIDATES**

- 1 Write your name and student number clearly on the front of the examination answer booklet.
- 2 You have 10 minutes to read this paper. You must not begin writing during this time.
- 3 There are TWO parts to this examination paper. You should attempt **ALL the questions in PART A** but select only **FOUR questions to answer in PART B**.
- 4 All answers must be written in the examination answer booklets provided.
- 5 Write the answers for question 1 to 40 on one page. Start the answer for each question beginning with question 41, on a **new** page. Do **not** use red ink or pencil.
- 6 Notes and textbooks are not allowed in the examination room.
- 7 Mobile phones and other recording devices are not allowed in the examination room.
- 8 Scientific and business calculators are not allowed in the examination room.

**MARKING SCHEME**

Marks are indicated at the beginning of each question. The total is **100** marks.

## PART A - MULTIPLE CHOICES

[40 x 1 = 40 MARKS]

For each of the questions in this section, you are required to select only ONE correct option and write the letter of that correct option in your answer booklet. All answers for this section should be placed on one page of the answer booklet and must be written in BLOCK letters.

### Question 1

What is the role of a web server?

- (A) It helps to create websites. (C) It allows a computer to connect to the World Wide Web.  
(B) It hosts web sites and serves web pages. (D) Both (B) and (C) are correct.

### Question 2

This key standard for the basic web architecture (2-tiered) is responsible for resource identification on the web.

- (A) HTML. (C) URL.  
(B) HTTP. (D) PHP.

### Question 3

Which of the following is responsible for web standards?

- (A) W3schools.com (C) Internet Service Provider (ISP)  
(B) World Wide Web Consortium (W3C) (D) Internet Engineering Task Force (IETF)

### Question 4

Which of the following is the gateway to the Internet?

- (A) CGI. (C) FTP.  
(B) ISP. (D) WWW.

### Question 5

If a web server listens on port 1000, what must be a typical URL to access a page hosted by the server?

- (A) `http://www.uni.ac.pg/home.html`  
(B) `http://www.uni.ac.pg/home.html:1000`  
(C) `http://www.uni.ac.pg:1000/home.html`  
(D) `http:1000//www.uni.ac.pg/home.html.`

### Question 6

What kind of web system can be better/easily created using a Content Management System (CMS)?

- (A) A web app with a custom workflow.  
(B) A complex web app such as Gmail, Google Classroom, etc...  
(C) An informational website.  
(D) Both (A) and (C).  
(E) All of (A), (B), and (C).

### Question 7

What is a semantic HTML tag?

- (A) It is a tag that marks up content to be displayed as expected.  
(B) It is a tag that marks up content to be displayed as expected and has a certain meaning.  
(C) It is a tag that marks up content to have a certain meaning but not displayed as expected.  
(D) None of these is correct.

**Question 8**

What is a presentational HTML tag?

- (A) It is a tag that marks up content to be displayed as expected but does not have any other importance.
- (B) It is a tag that marks up content to be displayed as expected and has a certain meaning.
- (C) It is a tag that marks up content to have a certain meaning but not displayed as expected.

**Question 9**

Where is JavaScript code interpreted?

- (A) By the OS on the client-side computer.
- (B) By a JS engine in a web browser.
- (C) By a JS engine on the client-side computer.

**Question 10**

I have a picture of a wooden table to be displayed on a web page. What tag should I use?

- (A) <table>
- (B) <iframe>
- (C) <div>
- (D) None of these.

**Question 11**

What common attribute of a tag is set with a text to be displayed as tool tip when the mouse is hovered on the element?

- (A) src
- (B) title
- (C) alt
- (D) name

**Question 12**

What HTTP request method is used by default when a hyperlink is clicked to retrieve a web page?

- (A) POST.
- (B) GET.
- (C) PUT.
- (D) OPTIONS.

**Question 13**

What HTTP request method is used mainly to **update** a resource?

- (A) POST.
- (B) GET.
- (C) PUT.
- (D) DELETE.

**Question 14**

What attribute of the <form> tag indicates the page or script that will receive the form data submitted?

- (A) name
- (B) method
- (C) target
- (D) action

**Question 15**

Multiple CSS class names can be specified for a certain HTML element. Which of the following shows the correct syntax to do that for a **p** element with class names **mimi**, **mono**, and **namb** ?

- (A) <p class = mimi, mono, namb>
- (B) <p class = "mimi, mono, namb">
- (C) <p class = "mimi mono namb">
- (D) <p class = "mimi" class = "mono" class = "namb">

**Question 16**

Suppose that I have a **div** element containing two **p** elements. The **div** element has a certain CSS ruleset that is applied to it. Which of the following is true?

- (A) The CSS ruleset for the **div** element will also be applied to the two **p** elements that it contains.
- (B) Only some of the rules/declarations in the ruleset will apply to the two **p** elements but not all the rules.
- (C) The CSS ruleset for the **div** element will not be applied on the two containing **p** elements at all.

**Question 17**

Which of the following CSS selectors is likely to select a specific element?

- (A) .ring                      (B) #magnet                      (C) a                      (D) p.row

**Question 18**

Bootstrap CSS framework had introduced a couple of components for UI design. What is an *accordion*?

- (A) A component that helps to create drop-down menus of different styles.  
 (B) A component that lets users expand and collapse sections of content.  
 (C) A component that helps to create a slideshow feature for images, etc...  
 (D) A component that produces a well laid out page header or footer.

**Question 19**

Which of the following is true about JQuery?

- (A) It is a JavaScript framework.                      (D) It is a scripting language similar to JavaScript.  
 (B) It is a JavaScript library.                      (E) Both (B) and (D) are correct.  
 (C) All of (A), (B), and (D) are correct.

**Question 20**

What terminology is used to refer to plain JavaScript?

- (A) ECMAScript.                      (C) NodeJS.  
 (B) Vanilla JavaScript.                      (D) ES15.

**Question 21**

What does the JQuery code below do?

```
$("#p").click(function(){
    $(".collapse").show();
});
```

- (A) It sets the click event for all p elements so that when a p element is clicked, any element with class name "collapse" gets shown.  
 (B) It sets the click event for a specific p element so that when that p element is clicked, it gets collapsed and then shown.  
 (C) It sets the click event for all p elements so that when a p element is clicked, all elements contained in the p element are collapsed and then they get shown.  
 (D) It sets the click event for a specific p element so that when the p element is clicked, any element with class name "collapse" gets shown.

**Question 22**

Which JQuery code below is the equivalent of writing the JavaScript statement shown as follows?

```
document.getElementsByClassName("column").innerHTML = "<span>Trials</span>";
```

- (A) \$("#column").html() = "<span>Trials</span>";                      (C) \$(".column").html.set("<span>Trials</span>");  
 (B) \$(".column").html("<span>Trials</span>");                      (D) \$(".column").html = "<span>Trials</span>";

**Question 23**

Which of the following is mandatory (always needed) for AJAX?

- (A) JSON.                      (C) XML.                      (E) All of these.  
 (B) XMLHttpRequest.                      (D) PHP.

**Question 24**

Which of the following is true regarding XML?

- (A) XML has a fixed set of standard tags just like HTML.
- (B) Tags in XML are case-sensitive. E.g: <xml> is not the same as <XML>.
- (C) An XML document cannot be accessed using DOM access techniques.
- (D) For a data set, its form in JSON will be larger in size than its form in XML.

**Question 25**

What does `json_obj` most likely store after the array is serialized to a JSON string in the code below?

```
var gems = ["Ruby", "Zasphur", "Ember"];  
var json_obj = JSON.stringify(gems);
```

- (A) {"Ruby", "Zasphur", "Ember"}      (C) "[Ruby, Zasphur, Ember]"
- (B) ["Ruby", "Zasphur", "Ember"]    (D) None of these.

**Question 26**

Which of the following languages are very similar in use, nature, type, and purpose to PHP?

- (A) Java.                                (C) ASP.Net
- (B) HTML.                                (D) Python.

**Question 27**

Which PHP string function can be used to extract "kwi" from "Sankwi Abuzo"?

- (A) `strlen()`                        (C) `substr()`
- (B) `strpos()`                        (D) `strrev()`

**Question 28**

```
$second = 10;  
function myfunction(){  
    $second ++;  
}
```

Is `$second` in the function defined above the same variable as the one declared outside the function?

- (A) Yes.
- (B) No.

**Question 29**

Given an object `$domgras` in PHP with public access to its properties `name` and `type`, what will be the code to display the value of `name`?

- (A) `echo $domgras.name;`            (C) `echo $domgras->$name;`
- (B) `echo $domgras.$name;`            (D) `echo $domgras->name;`

**Question 30**

Which of the following is the correct PHP code to open a file named `data.txt` to input additional data to?

- (A) `$file1 = fopen("data.txt", "r");`
- (B) `$file1 = fopen("data.txt", "i");`
- (C) `$file1 = fopen("data.txt", "w");`
- (D) `$file1 = fopen("data.txt", "a");`

**Question 31**

Which PHP function is used to redirect to a certain web page? (NB: Some function names listed do not exist.)

- (A) location()
- (B) header()
- (C) redirect()
- (D) print()
- (E) url()
- (F) None of these.

**Question 32**

In order for **file uploading** to work, which attribute-value combination should be specified for the **<form>** tag?

```
<form method="post" action="process_upload.php"><input type="file"></form>
```

- (A) target = \_blank
- (B) id = "fileUploadForm"
- (C) name = "fileUpload"
- (D) enctype = "multipart/form-data"

**Question 33**

Which super global array in PHP can be consulted to learn about the type of HTTP request?

- (A) \$\_FILE
- (B) \$\_POST
- (C) \$\_REQUEST
- (D) \$\_SERVER
- (E) None of these.

**Question 34**

Which PHP super global array contains the contents of these three super global arrays: \$\_POST, \$\_GET, and \$\_COOKIE?

- (A) \$\_FILE
- (B) \$\_REQUEST
- (C) \$\_SERVER
- (D) \$\_COOKIE

**Question 35**

Apart from the \$\_SESSION array, which other super global array can be used effectively in session management?

- (A) \$\_REQUEST
- (B) \$\_ENV
- (C) \$\_COOKIE
- (D) \$\_SERVER

**Question 36**

What is the use of the **include** function/statement in PHP?

- (A) It is used to open any file in PHP.
- (B) It is used to extend a file by the contents of another file.
- (C) It is only used to import functions or classes from a PHP library file into a script.
- (D) None of these is correct.

**Question 37**

Which of the following statements correctly creates a cookie named **favmusic** which will be destroyed after 2 minutes.

- (A) setcookie("favmusic", "bus driver", 2);
- (B) setcookie("favmusic", "bus driver", time() + 2);
- (C) setcookie("favmusic", "bus driver", time() + 120);
- (D) None of these is correct.

**Question 38**

What is the best way that developers can make their web applications communicate to each other?

- (A) One developer must provide access to its application's source code to the other developers.
- (B) Use a third party web application.
- (C) One or more developers should make available web APIs.
- (D) All the concerned developers must sign MOUs and agree to work together.

**Question 39**

What is Gmail as described in the following text? Gmail can be accessed via different e-mailing applications on the web. Gmail users may find themselves using different e-mailing applications apart from the standard Gmail app to access their gmail accounts.

- (A) It is a web application.
- (B) It is a website.
- (C) It is a web service.
- (D) It is an e-mail server.

**Question 40**

What text standard is mostly used with web services nowadays because of its ease of use?

- (A) XML
- (B) JSON

**IMPORTANT INSTRUCTION:**

For this part of the examination paper, there are **six** questions. You are to **select any four questions** and answer them completely to earn the full 15 marks allocated per question. Write the question numbers as given and do not renumber the questions in your answer booklet.

**Question 41 [3 + (2 + 2 + 2) + 3 + 3 = 15 Marks]**

Below are WEB background questions.

- (a) Give an example of a URL and label the protocol, domain name, file path and file name in the URL.  
 (b) Briefly **explain** the following items:  
 (i) World Wide Web                      (ii) URL                                      (iii) Web client
- (c) Differentiate between the 2-tiered and 3-tiered web architectures.  
 (d) Differentiate between website and web application.

**Question 42 [6 + 1 + 3 + 1 + 1 + 3 = 15 Marks]**

Below are mostly HTML-related questions.

- (a) List and explain the three web page design concerns and show their association with the three basic web development tools (HTML, ...).  
 (b) Click and Blur are two HTML events. Name one other HTML event and describe it.  
 (c) In your web programming so far, you have seen the <div> tag multiple times. And especially with Bootstrap or other CSS libraries and frameworks you would use this tag more often. Briefly describe what this tag is, what it is used for, and compare it with other similar tags.

Answer the following questions by writing out the complete HTML code expected.

- (d) Attach the function `rename()` to the button below so that this function runs when the button is clicked. `<button>Rename</button>`
- (e) Make the element below into a link that goes to `index.html` located at the root of your webserver. (Use relative file path.) `<a>Home</a>`
- (f) Make the following form send a password to "**formhandler.php**" found at the root of the web directory, and make the form indicate to the browser that the response from the form's handler should be displayed in a new tab/window. (Hint: You would use one of `_self`, `_blank`, `_parent`, or `_top` in one of the blank spaces shown)

```
<form action="_____ " method="_____ " target="_____ ">
  Your password: <input type="password"><br><input type="submit"></form>
```



**Question 43 [1 + 3 + 2 + (2 + 2 + 1 + 1 + 3) = 15 Marks]**

**Below are CSS-related questions.**

- (a) Can you assign multiple class names to an HTML element? (Yes/No)
- (b) Is Bootstrap a CSS library or CSS framework? Give the reason for your answer.
- (c) Below, on the left is a piece of CSS code that will affect two elements on a web page. On the right, part of the HTML code that has these two elements is shown.

<pre>#firstp {   display: none;   background-color: yellow;   padding: 20px; } #firstdiv:hover #firstp {   display: block; }</pre>	<pre>&lt;div id= "firstdiv"&gt;This is a div element.&lt;/div&gt; &lt;p id= "firstp"&gt;This is a p element.&lt;/p&gt;</pre>
--	--

Describe the effect that the CSS code will have on the web page and specifically the two elements.

- (d) Study the following bare HTML code and answer the questions that follow.

```
.....
<body>
<div id="main_container">
  <h1>...</h1>
  <p id="p1" class="cp1">...</p>
  <p id="p2" class="cp1">...</p>
  <p id="p3" class="cp1">...</p>
</div>
<div id="aside_container">
  <h1>...</h1>
  <p class="p4">...</p>
</div>
</body>
.....
```

- (i) Write a CSS ruleset to change the text color of the second paragraph in the `main_container` div element to green. Also include two rules in this CSS ruleset to put 20 pixel spaces on the left and right sides of the paragraph.
- (ii) Write a CSS ruleset that can **only** apply to the p element in the `aside_container` div element. This ruleset must have two rules (declarations) to give a background color of black and text color of white to the p element.
- (iii) If you would like to write a ruleset that can **only** be applied to the h1 element in the `aside_container` div element what will the selector of that ruleset be?

- (iv) If you would like to write a ruleset that can be applied to all the `h1` elements and the `p` elements what will the selector of that ruleset be?
- (v) Using the pseudo-class selector `hover`, write a CSS ruleset that will make only the first three `p` elements become twice larger when the mouse points over them. Re-write and complete the code shown below in your answer booklet.

```

_____ : _____ {
    font-size: ____ em;
}

```

**Question 44 [2 + 1 + 2 + 2 + 2 + 3 + (1 + 1 + 1) = 15 Marks]**

**Below are JavaScript-related questions.**

- (a) Explain what ECMAScript is.
- (b) Name one other web client scripting language just like JavaScript.
- (c) Is JavaScript strictly typed or loosely typed? Explain your answer.
- (d) Store the names Peter, May, and John in an array named `names`. Write only one statement for this.
- (e) Write code to create an object named `classcaptain` that stores the details for Peter. The details are:
  - Name: Peter
  - Age: 23
- (f) Write code for a function named `addName` that will display an input box (using the `prompt()` function) each time to get the first name and last name of a person, joins these two names, and appends the full name to a list element (`<ul>`) on the current web page whose id attribute value is `"nameList"`. (Use any DOM methods that will help you to achieve this task.)
- (g) Given below are two statements in JavaScript.

```

var pn = document.getElementsByTagName("p");
var p1 = pn[3];

```

- (i) What is stored in `pn` or what does `pn` refer to?
- (ii) What is stored in `p1` or what does `p1` refer to?
- (iii) If there is no `p` element in the web page, then what will be stored in `pn` ?

**Question 45 [1 + 4 + (2 + 4) + 4 = 15 Marks]**

**Below are JSON, XML, AJAX, and Web Service-related questions.**

- (a) What does AJAX stands for?
- (b) Fill the blanks in the code below. The code will prepare an XMLHttpRequest object and send it using the GET method to the server. (Label the blanks as shown in your answer booklet.)

```
function getServerData(strData){
    var request = new _____(i)_____;
    request.onreadystatechange = function(){
        if ((this.readyState == ___(ii)___) && (this.status == 200)){
            var dDIV = document.getElementById("detailPane");
            dDIV.innerHTML = request._____(iii)_____; //Display returned text.
        }
    };
    request.open("_____(iv)_____", "action.php?n=" + strData, true);
    request.send();
}
```

- (c) Given below is an XML document.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<bscsthree>
<subject><title>Programming</title><code>CS302</code></subject>
<subject><title>Database</title><code>CS304</code></subject>
<subject><title>Networking</title><code>CS306</code></subject>
</bscsthree>
```

- (i) What is the root element of the document?
- (ii) The JSON version of the XML document will show the subject records as objects in an array and thus have this structure: { bscsthree : [{ }, { }, { } ] }  
Completely write out the JSON form of the XML document filling in the structure shown above or using your own structure that you think is more meaningful.

- (d) Apart from the GET and POST HTTP request methods commonly used, there are a few others that are used with web services which enable CRUD operations. Fill the table below with each HTTP request method that corresponds to the correct CRUD operation. (Draw this table in your answer booklet.)

OPERATION	HTTP REQUEST METHOD
Create	
Update	
Delete	
Read	



- (e) Write a setter method/function that sets the value of `$color` in the class shown below. Note that this method must have a parameter.

```
class Fruit {
    private $name;
    private $color;
    function __construct($name) {
        $this->name = $name;
    }
    function __destruct() {
        echo "The fruit is {$this->name}.";
    }
    function getName(){
        return $this->name;
    }
    //Write the color setter method here (below this line).
```

```
}//End of Fruit class definition.
```

**END OF EXAMINATION**