# ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

**ORGANISATION OF ISLAMIC COOPERATION (OIC)**

**Department of Computer Science and Engineering (CSE)**

**SEMESTER FINAL EXAMINATION** **WINTER SEMESTER, 2021-2022**

**DURATION: 3 HOURS** **FULL MARKS: 150**

## CSE 4539: Web Programming

Answer all **6 (six)** questions. Marks of each question and corresponding CO and PO are written in the right margin with brackets.

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1. You are given an HTML body shown in Figure 1.

```
<body>
    <h1>A Collection of the best recipes ever</h1>
    <article id="recipe-list">
        <ul>
            <li>Holiday Cookies</li>
            <li>Lasagna</li>
        </ul>
    </article>
    <article id="recipe-area">
        <h2>Holiday Cookies</h2>
        <article id="ingredients">
            <ul>
                <li>flour</li>
                <li>sugar</li>
            </ul>
        </article>
        <p class="instruction">Combine all the ingredients.</p>
        <p class="instruction">Wish on a shooting star.</p>
    </article>
</body>
```

**Figure 1:** Body part of an HTML for Question 1

a) What are tags and attributes in HTML? Explain in detail with the help of Figure 1. 5 (CO1) (PO1)

b) Draw the Document Object Model(DOM) tree based on Figure 1 that corresponds to the hierarchy of the body HTML (ignore the text, text nodes, and tag attributes - just refer to tag names in boxes and parent/child relationships with lines between boxes). 10 (CO2) (PO2)

c) Style the Figure 1 with the following requirements: 10 (CO2) (PO2)

i. The background of the entire page should be *#123456*.

ii. The color of the text for all the headings should be *green*.

iii. Every element with the class *instruction* should have a border that is 2 pixels and red.

iv. The text in the list inside the article with the id *ingredients* should have a font preference of Arial, Helvetica, or any other sans-serif font.

```
<body>
    <style>
        #subtitle-1{
            width: 50px;
            height: 60px;
            margin: 10px;
            margin-top: 20px;
            margin-bottom: 30px;
            border: 3px solid;
            padding: 5px;
            padding-right: 25px;
        }
    </style>
    <p id="subtitle-1">Topics:</p>
    <ul id="list-1">
        <li id="topic-1">What is the Internet</li>
        <li id="topic-2">How to do the Internet</li>
        <li id="topic-3">How to make the Internet</li>
        <li id="topic-4"> Make cool projects:
            <ol id="list-2">
                <li id="hw-1">Make Pies</li>
                <li id="hw-2">Watch Lion King</li>
                <li id="hw-3">Go <em id="em-2">on</em> fast</li>
                <li id="hw-4">Push squares around</li>
                <li id="hw-5">Catch 'em all!</li>
            </ol>
        </li>
    </ul>
</body>
```

**Figure 2:** Body part of an HTML for Question 2

2. You are given an HTML body shown in Figure 2.

a) Identify a specific example where it is better to use a POST request instead of a GET request and justify your choice. 5 (CO1) (PO1)

b) Describe the above style ($\#subtitle-1$) in natural language and draw the labeled diagram of the resultant output. 10 (CO2) (PO2)

c) Write the ID's with justification of the elements selected by each of the given selectors listed in Figure 2: 10 (CO2) (PO2)

i. p
ii. ol li
iii. li em
iv. ul > li
v. li li

3. Assume a library management system where a book can be dynamically added, updated, and deleted from the library.


**(a)** Add book

| #SL | Name | Autor | Genre | Action |
|---|---|---|---|---|
| 1 | The Art of War | Sun Tzu | Non-fiction | Update Delete |
| 2 | The Alchemist | Paulo Coelho | Novel | Update Delete |
| 3 | Beloved | Toni Morrison | Novel | Update Delete |
| 4 | War and Peace | Leo Tolstoy | Fiction | Update Delete |

**(b)** Display book information with the update and delete action

**Figure 3:** Different operations related to book for Question 3.

a) What are the advantages of using a SQL database over text files to store data? 5 (CO1) (PO1)

b) Write the corresponding HTML code based on the Figure 3.(a) and validate the following requirements in JavaScript. 10 (CO1) (PO1)
   i. Name: required, a combination of A-Z and a-z.
   ii. Author: required, at least two words for first and last names.
   iii. Genre: required, can be Fiction, Novel, Non-fiction.

c) Analyze the Figure 3.(b) and write the corresponding PHP code for the update and delete operations. Assume, an id is attached for every book with the update and delete links. 10 (CO2) (PO2)

4. Cricket and Football are two different types of Ball. Ball has one property named type, which is initialized in the constructor. Besides, it has one method, *draw()* which basically prints whether it is cricket ball or football based on the type of the ball.

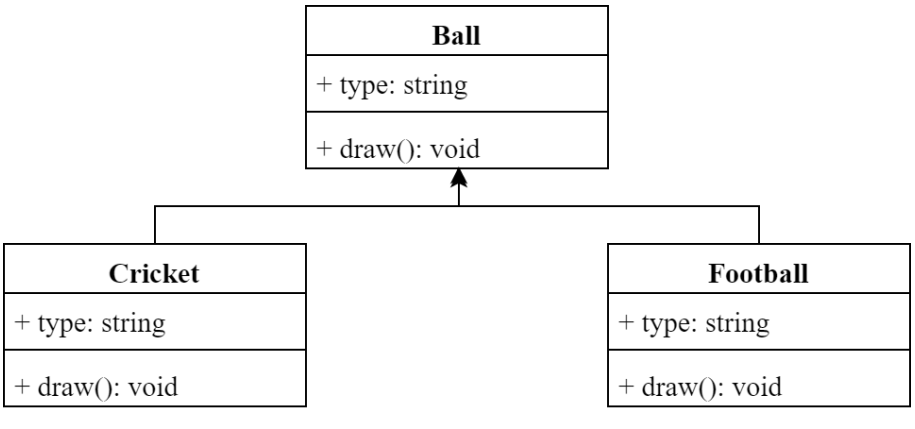


**Figure 4:** Inheritance example for Question 4.

a) What is the relationship between classes and objects? Describe with examples. 5 (CO1) (PO1)

b) What is inheritance? Implement the above scenario using OOP concept in PHP language. 10 (CO2) (PO2)

c) If another class named *child* inherits both Cricket and Football class and calls the *draw* method, which *draw* method will be called? Explain with respect to PHP language. 10 (CO3) (PO2)

5. Consider the following JSON object given in Figure 5 and answer the subsequent questions.

```
let miniJSON = {
    "waffle" : ["PANCAKE"],
    "pancake" : "waffle",
    "POPTART" : {
        "frosted" : true,
        "flavors" : ["cherry", "strawberry", "jolly rancher"]
    }
};
```

**Figure 5:** Body part of an HTML for Question 5

a) What is JSON? How to parse it in JavaScript? 5 (CO1) (PO1)

b) For each of the following statements, write the value that would be returned (include "" around any string values; if any expression would result in an error, write error. If any expression would return the value undefined, specify this as your answer 10 (CO2) (PO1)

i. miniJSON[0]
ii. miniJSON.pancake
iii. miniJSON[“FOO”]
iv. miniJSON[“POPTARTS”].flavors[1]
v. miniJSON[miniJSON[“pancake”]].length

c) How can developers use the above JSON object in AJAX to communicate between the client and the server? AJAX stands for Asynchronous JavaScript and XML. 10 (CO2) (PO2)

6. A course has three properties such as course code, name, and credit. Student A and B define the course object differently. Student A defines all the properties as well as a method named *getDetails(courseCode, name, credit)*. But student B does not implement any method.

a) What are the differences between var, let, and const? Describe with examples. 5 (CO1) (PO1)

b) According to the above scenario, implement both objects (A and B). 10 (CO2) (PO2)

c) How does Student B call the function *getDetails(courseCode, name, credit)* of Student A. Discuss using JavaScript's built-in .call(), .apply() and .bind() methods. 10 (CO2) (PO2)