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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

ORGANISATION OF ISLAMIC COOPERATION (OIC)

Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION
DURATION: 3 HOURS

SUMMER SEMESTER, 2021-2022
FULL MARKS: 150

SWE 4637: Web and Mobile Application Development

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer **all 6 (six)** questions. Figures in the right margin indicate full marks of questions whereas corresponding CO and PO are written within parentheses.

1. You are given an HTML code shown in Code Snippet 1.

```
<body>
    <style>
        #caption{
            width: 20px;
            height: 30px;
            margin: 10px;
            margin-top: 20px;
            border: 3px 5px solid;
            padding: 5px 7px 8px;
            outline: 5px;
        }
    </style>
    <caption id="caption">Program: SWE</caption>
    <nav>
        <h4>List of courses</h4>
        <ul>
            <li>WP</li>
            <li>DS
                <ol>
                    <li>BFS</li>
                    <li>DFS</li>
                </ol>
            </li>
            <li>WS</li>
        </ul>
    </nav>
    <footer>..Many more</footer>
</body>
```

Code Snippet 1: Body part of an HTML for Question 1.

a) What are ID and class in HTML attributes? Explain in detail with the help of Code Snippet 1. 5 (CO1) (PO1)

b) Draw the Document Object Model tree based on Code Snippet 1 that corresponds to the hierarchy of the body HTML (ignore the text, and tag attributes - only refer to tag names). 10 (CO2) (PO2)

c) Draw the labeled diagram of the first *caption* tag having ID `#caption` and calculate the area of the box model. 10 (CO2) (PO2)

2. IUT students maintain a table for their exam schedule as shown in Table 1.

Table 1: Exam Schedule for Question 2.

Date	Exam Related Information			
	Schedule		Room	Course Info.
	Begin	End		
04.05.2023	1:00 PM	1:30 PM	301	SWE 4637: WP
			302	SWE 4501: DP
05.05.2023	1:00 PM	1:30 PM	301	SWE 4637: WP
	1:35 PM	2:05 PM		Math 4143: DE
	2:00 PM	2:30 PM	508	CSE 4145: DT

a) Write the corresponding HTML code (only table part) for the table. 10 (CO2 (PO1

b) Write the corresponding HTML code (only list part) if you want to present the table shown in Table 1 in a multilevel list. 15 (CO2 (PO2

3. Suppose you are building a blog application where users can view blog posts and create new ones. Your application has the following pages:

- Home page: Displays a list of all blog posts
- Single post page: Displays a single blog post with comments
- Create post page: Allows users to create a new blog post

a) What are the differences among local storage, session storage, and cookies? (CO (PO

b) Analyze the given scenario to implement the following: 2×1
   i. `app.js` file containing switch and route. (CO (PO
   ii. the three components of home, single post, and create post pages.

are given an HTML code shown in Code Snippet 2.

```
<body>
    <main id="main">
      <div id="div-1">
        <h2 id="h21">Main Content Area</h2>
        <p id="p1">First paragraph.</p>
        <p id="p2">Second paragraph.</p>
        <ul id="d-ul1">
            <li id="ul-li-11"><a href="#" id="hr-11">Link 1</a></li>
            <li id="ul-li-21"><a href="#" id="hr-21">Link 2</a></li>
        </ul>
      </div>
      <p id="mid">Middle</p>
      <div id="sidebar">
        <h2 id="s-h">Sidebar</h2>
        <ul id="d-ul">
          <li id="ul-li-1"><a href="#" id="hr-1">Link 1</a></li>
          <li id="ul-li-2"><a href="#" id="hr-2">Link 2</a></li>
          <li id="ul-li-3"><a href="#" id="hr-3">Link 3</a></li>
        </ul>
      </div>
    </main>
    <footer id="footer">
        <p id="f-p-1">All Rights Reserved</p>
        <p id="f-p-2">IUT, CSE</p>
    </footer>
</body>
```

Code Snippet 2: Body part of an HTML for Question 4.

a) Briefly discuss CSS combinators with the help of Code Snippet 2. 5 (CO1) (PO1)

b) Write the ID's of the elements selected by each of the given selectors listed in Code Snippet 2 with proper justification: 8×2.5 (CO2) (PO2)

i. `main > div`
ii. `main > div h2`
iii. `main > div p:nth-of-type(2)`
iv. `body > #f-p-1`
v. `div + div`
vi. `div + p`
vii. `main ul li:nth-of-type(2)`
viii. `li ~ li`

5. The life cycle of any activity of an Android app is shown in Code Snippet 3.

```
public class MyApp extends Activity {
    public void onCreate() { ... }
    public void onStart() { ... }
    public void onResume() { ... }
    public void onPause() { ... }
    public void onStop() { ... }
    public void onDestroy() { ... }
}
```

Code Snippet 3: Activity Life Cycle for Question 5.

a) What are the differences between explicit and implicit Intents in Android, and in what scenarios should you use each one?

b) Suppose you were using a video streaming application, "Zoom", on your mobile device to attend an online class. Suddenly, someone messaged you in the "WhatsApp" app, and you viewed the message without closing the "Zoom" app.

i. In light of the Activity Life Cycle in Code Snippet 3, analyze the steps from starting the "Zoom" application to switching to the "WhatsApp" application with a suitable diagram.

ii. Considering you have finished using the "WhatsApp" application, explain the steps for returning back to the "Zoom" application.

c) What are ViewGroups? Using Relative and Constraint layouts, describe at least 3 (three) layout attributes and at least 4 (four) layout parameters for the views/widgets in the layout.

6. A Ramadan app that helps users to keep track of their fasting, prayer times, and other religious observances during the holy month of Ramadan. To provide the best possible experience for users, the app needs to access data from other apps and the device itself.

When the user first installs the app, they are prompted to grant permissions for the app to access data on their device. The app requests permission to access the user's device data, including the time, date, and location. This allows the app to accurately calculate prayer times based on the user's location and to adjust for changes in daylight saving time. The app also requests permission to access the user's calendar app, so it can automatically add prayer times and reminders for breaking fast to the user's schedule.

In addition to accessing data from other apps and the device, the Ramadan app also uses its own app-specific data to provide a personalized experience for users. For example, the app may allow users to set reminders for specific prayer times or to track their fasting progress throughout the month. The app stores this app-specific data using key-value pairs, which allows the app to easily retrieve and update data as needed. The app may also share data with other apps on the user's device, such as a fitness app that tracks the user's physical activity during fasting hours.

a) What are the design guidelines that you should follow to develop the Ramadan app?

b) Analyze the given scenario and categorize the required permissions into different permission groups with appropriate justification.

c) Analyze the Ramadan app data and categorize those into different storage options with proper justification.