1) a) Briefly explain why JS is referred to as a ***dynamic*** language.

JS is *dynamic* typed language since a variable's type may be changed during run-time. Also, it allows mixed values in an array (e.g. integers and strings).

b) Define a dictionary in JS having the following three key-value pairs: name:joe, age:21, major:astronomy.

let hello =[name:"joe", age:21, major:"astronomy"]

c) Give one example for each of the two notations, *dot* and *bracket*, used for referencing values.

dot notation ➔ hello.age
bracket notation ➔ hello[age] or hello['age'] or hello[1]

d) Ben made a change in JS code but its effect is not shown on the corresponding webpage. No error is being displayed on the webpage either. What can Ben do to see a possible error in his code?

Ben should use Browser Developer Tools to debug the code. For example, in Chrome, Ben can right-click and select ***Inspect*** to open Dev Tools ***Console*** for detailed inspection of any errors.

2) a) Using getElementById() JS function, show statements to change the size of "head1" DIV HTML element to 200px-by-200px.

document.getElementById("head1").style.height = "200px";
document.getElementById("head1").style.width = "200px";

b) Using getElementById() JS function, write a statement to show the value of the text of "head1" HTML element in an alert box.

alert(document.getElementById("head1").innerHTML);

c) Show a statement to make "head1" HTML element clickable to call function ***fnc1*** when clicked.

document.getElementById("head1").addEventListener("click",fnc1);

d) Show the respective CSS code of "core" HTML DIV of 150px-by-150px size with its center located at the center of its parent DIV of 400px-by-400px.

```css
#core {
        height: 150px;
        width:150px;
        margin-left:125px;
        margin-top: 125px;
}
```

3) Consider "hello" HTML element which is clickable and calls function **fnc3** when clicked on. Write function **fnc3** which changes the color of the text of HTML element "world" to green if it was red, and to red if it was green (or some other color).

```javascript
function fnc3() {
        let x = document.getElementById("world");
        if(x.style.color=="red") {
                x.style.color="green";
        }
        else {
                x.style.color="red";
        }
}
```

4) a) Consider the following HTML code of a form:

```html
<form id="form1" action="https://www.utsa.edu" method="post" onSubmit="return fnc4();">
        <p>
                <input type="text" id="major" name=""> </br>
                <input type="submit" value="submit">
        </p>
</form>
```

Complete the above form so that when "submit" button is clicked, **fnc4** function is called and if **fnc4** returns true https://www.utsa.edu is called.

b) Write the code for **fnc4** function such that the function returns *true* if the input field text equals "engineering" or "biomedicine," otherwise, the function returns *false*.

```javascript
function fnc4() {
        let x = document.getElementById("major");
        if(x.value=="engineering || x.value=="biomedicine") {
                return true;
        }
        else {
                return false;
        }
}
```

5) Consider the following combination of HTML/CSS/JS code:

```
<!DOCTYPE html>
<html>
        <head>
                <link rel="stylesheet" type="text/css" href="e5.css" />
                <script src="script5.js"></script>
        </head>
        <body>
                <div id="mySpace"></div>
        </body>
</html>
```

```
/*CSS e5.css file*/
.mySpace {
        background-color: green;
        color: black;
        width: 600px;
        height: 600px;
        margin-left: 20px;
}
```

```
//JavaScript script5.js file
document.getElementById("mySpace").innerHTML="This is my space to launch ideas from.";
```

a) Mary says that executing the HTML code in a browser will cause an error in the JS code. Assuming that she is correct, what error will be caused?

mySpace is not defined

b) Ben claims that CSS file does not correctly specify the style of DIV "mySpace." Assuming he is correct, what is the problem with the CSS code?

Must be #mySpace instead of .mySpace

c) Show the *complete* updated HTML code within <body> tag to specify "myIdeas" DIV of size 40px-by-60px anywhere within "mySpace" DIV. Show the corresponding CSS code in Part #d.

```
        <body>
                <div id="mySpace">
                        <div id="myIdeas">
                        </div>
                </div>
        </body>
```

d) CSS code for Part #c:

```
        #myIdeas {
                height:40px;
                width:60px;
        }
```