National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Software Testing	Course Code:	CS4036
	Degree Program:	Computer Science	Semester:	Fall 2022
	Exam Duration:	60 Minutes	Total Marks:	35
	Paper Date:	11th Nov, 2022	Weight	10
	Section:	7A & 7B	Page(s):	5
	Exam Type:	Midterm-II		

Student : Name:_____ **Roll No.**_____ **Section:**_____

Instruction/Notes:

Attempt all questions on the question paper. Answer sheets are not required.
Take Assumptions where required and note them down along with your answers.

Question #1:[3+10+2]

The below function finds the most frequent integer number in parameter ***arr[]*** of length ***n***.

```
void frequent_element(int arr[], int n) {

  int i, j, max_count = 0;
  cout << "\nMost occurred number: ";

  for (i = 0; i < n; i++) {
    int count = 1;
    for (j = i + 1; j < n; j++) if (arr[i] == arr[j]) count++; if (count > max_count)
      max_count = count;
  }

  // this loop checks if there are more than one elements that are repeated

  for (i = 0; i < n; i++) {
    int count = 1;
    for (j = i + 1; j < n; j++)
      if (arr[i] == arr[j])
        count++;

    if (count == max_count)
      cout << arr[i] << endl;

  }
}
```

a) Considering the input integer array ***arr[]*** and the array size ***n,*** Identify minimum test cases to achieve 100% statement coverage.

b) Draw the control flow graph and compute cyclomatic complexity

c) What more test cases (if any) will be required to achieve 100% branch coverage

Question #2:[3+7]

a) Identify the CSS selectors and Xpath selectors for the three web elements highlighted in the screenshots

Cheatsheat:

i)	Basic XPath	//tagname[@attribute='value']	e.g "//input[@name='email']"
ii)	Basic CSS Selector	tagname[attribute='value']	e.g "input[name='email']"
iii)	Xpath for ID	//*[@id='value']	e.g."//*[@id='email']"
iv)	CSS selector for ID	#@id	e.g."#email

b) Write a basic UI automation script to open the above web page using the following URL. Perform the assertion that conclusion link is present and then click the conclusion link

   i) https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/HTML_basics

Note: Use a proper structure of test script based on the framework that you used in assignment

Question #3:[5+5]

a) Explain the major differences between following environments

i) QA Environments

ii) Staging Environments

iii) Production Environments

b) Identify any 5 key actions that tester need to perform for test data management