



Department of Computer Science  
UET Lahore, New Campus

Name:

M. Samiullah

Registration No:

2020-SE-25

EXAM: MID-TERM

SE-331: Software Quality  
Engineering

Time Limit:

90 minutes

Total Marks: 50

Marks Obtained:

Semester: FALL 2020

| Q. No.      | Solve the following questions and write the answers on answer sheet.  | MARKS     |
|-------------|---|-----------|
| 1<br>[CLO1] | <p>Calculate Cyclomatic Complexity for the given code. Also draw the control flow graph and find all independent paths for white box testing.</p> <pre>(1) { int i, j, k; (2) (3)     for (i=0(4); i&lt;=N(5); i++) (6) p[i] = 1; (7)     for (i=2(8); i&lt;=N(9); i++)     {         k = p[i]; j=1; (10)         while (a[p[j-1]] &gt; a[k] {             (11) p[j] = p[j-1];             (12) j--; }         }     (13) p[j]=k; }</pre> | 10 points |

|             |  |           |
|-------------|--|-----------|
| 2<br>[CLO2] | <p>Design equivalence classes for a UET admission eligibility function and write all weak robust equivalence class test cases. Consider a function that receive two parameters, matric percentage marks and fsc percentage marks. If conditions value are in valid range then eligible otherwise not eligible. (Hint: If you want full marks draw dot diagram and all test cases in table)</p> <pre>public bool Admission_Eligibility (float Matric, float FSC) {     If (Matric &gt;= 30% &amp;&amp; Matric &lt;= 60% &amp;&amp; FSC &gt;= 70% &amp;&amp; FSC&lt;= 90%)     {         Return true;     }     Else     {         Return false;     } }</pre> | 10 points |
|-------------|--|-----------|

|             |   |           |
|-------------|---|-----------|
| 3<br>[CLO1] | Apply worst-case boundary value testing technique on the given function bool Admission_Eligibility (float Matric, float FSC) in question 2 and write all test cases in a table with proper expected values. Also draw dot diagram to show from where you have selected test values. | 10 points |
|-------------|---|-----------|

|             |   |           |
|-------------|---|-----------|
| 4<br>[CLO4] | <p>Identify all the test cases for triangle problem using decision table technique.</p> <p>c1. <math>1 \leq a \leq 200</math> c4. <math>a &lt; b + c</math><br/> c2. <math>1 \leq b \leq 200</math> c5. <math>b &lt; a + c</math><br/> c3. <math>1 \leq c \leq 200</math> c6. <math>c &lt; a + b</math></p> <p>1. If all three sides are equal, the program output is Equilateral.<br/> 2. If exactly one pair of sides is equal, the program output is Isosceles.<br/> 3. If no pair of sides is equal, the program output is Scalene.<br/> 4. If any of conditions c4, c5, and c6 is not met, the program output is NotATriangle.</p> | 10 points |
|-------------|---|-----------|

5  
[CLO2]

Consider the login page test case word template and rewrite the missing heading names, where question marks are seen.

10 points

|                  |        |                       |   |
|------------------|--------|-----------------------|---|
| ? <b>Test ID</b> | BU_001 | Test Case Description | Test the Login Functionality in Banking |
| Created By       | Mark   | Reviewed By           | Bill                                    |
|                  |        | Version               | 2.1                                     |

**QA Tester's Log** Review comments from Bill incorporate in version 2.1

|                 |      |             |            |                 |      |
|-----------------|------|-------------|------------|-----------------|------|
| ? <b>Tester</b> | Mark | Date Tested | 1-Jan-2017 | ? <b>Status</b> | Pass |
|-----------------|------|-------------|------------|-----------------|------|

| S # |                          |
|-----|--------------------------|
| 1   | Access to Chrome Browser |
| 2   |                          |
| 3   |                          |
| 4   |                          |

| S # | ? <b>Input s/credentials</b> |
|-----|------------------------------|
| 1   | userid = mg12345             |
| 2   | Pass = df12@434c             |
| 3   |                              |
| 4   |                              |

**Environment** Mac OS, chrome 1.5

| Step # | Steps' description  | Expected Output           | Actual Output | Pass / Fail / Not executed / Suspended |
|--------|---|---------------------------|---------------|--|
| 1      | Navigate to <a href="http://demo.guru99.com">http://demo.guru99.com</a> | Site should open          | As Expected   | Pass                                   |
| 2      | Enter <u>userid</u> & Password  | Credential can be entered | As Expected   | Pass                                   |
| 3      | Click Submit  | Customer is logged in     | As Expected   | Pass                                   |
| 4      |   |                           |               |  |
|        |   |                           |               |  |
|        |   |                           |               |  |

**BEST OF LUCK ☺**

## UNIVERSITY OF ENGINEERING AND TECHNOLOGY, LAHORE



Reg. No.

2020-SE-25

Supdt. Signature

Session: 2020

Date: 13/03/2023

1. Semester: 6th 2. Degree Program Software Engineering (SE)  
 3. Subject Software Quality Engineering (SQE)

**CANDIDATE MUST READ THE FOLLOWING INSTRUCTIONS:**

1. The Answer Book contains 16 pages and no leaf is to be torn out.
2. No Extra Sheet will be provided.
3. Candidate must write his/her Reg. No. in the specified Box.
4. **Candidate found guilty of using UNFAIR MEANS shall be liable to disciplinary action.**
5. Candidate creating disturbance in or around the Examination Hall during the examination shall be liable to disciplinary action.
6. Candidate should answer only as many questions as are required to be answered. If the answers are more than the specific number, he/she runs the risk of losing credit for his/her best answers, as the examiner may see only those answers which have been first answered according to the specific numbers.
7. Candidate is not permitted to leave the Examination Hall/Room until the expiry of one hour after the distribution of the question paper.
8. The answer Book must be returned to the Superintendent before leaving the Examination Hall.
9. Mobiles and other helping material are strictly prohibited in the examination Center.

| Q. No | Maximum Marks | Obtained Marks |
|-------|---------------|----------------|
| 1.    |               | 10             |
| 2.    |               | 8              |
| 3.    |               | 10             |
| 4.    |               | 10             |
| 5.    |               | 10             |
| 6.    |               | 1              |
| 7.    |               |                |
| 8.    |               |                |
| 9.    |               |                |
| 10.   |               |                |
| Total |               | 49             |

Examiner's Full Signature \_\_\_\_\_

Total Marks Obtained in Words \_\_\_\_\_





Q #4

| Condition stub | Condition entries |   |   |   |   |   |   |   |   |   |   |
|----------------|-------------------|---|---|---|---|---|---|---|---|---|---|
| $a < b + c?$   | F                 | T | T | T | T | T | T | T | T | T | T |
| $b < a + c?$   | -                 | F | T | T | T | T | T | T | T | T | T |
| $c < a + b?$   | -                 | - | F | T | T | T | T | T | T | T | T |
| $a = b?$       | -                 | - | - | T | T | T | T | F | F | F | F |
| $a = c?$       | -                 | - | - | T | T | F | F | T | T | F | F |
| $b = c?$       | -                 | - | - | T | F | T | F | T | F | T | F |
| Action stub    | Action entries    |   |   |   |   |   |   |   |   |   |   |
| Not a triangle | X                 | X | X |   |   |   |   |   |   |   |   |
| Equilateral    |                   |   |   | X |   |   |   |   |   |   |   |
| Scalene        |                   |   |   |   |   |   |   |   |   |   | X |
| Isoceles       |                   |   |   |   |   |   | X |   | X | X |   |
| Impossible     |                   |   |   |   | X | X |   | X |   |   |   |

| Test ID | a   | b   | c   | Expected Output |
|---------|-----|-----|-----|-----------------|
| 1       | 10  | 5   | 5   | Not a triangle  |
| 2       | 5   | 10  | 5   | Not a triangle  |
| 3       | 5   | 5   | 10  | Not a triangle  |
| 4       | 100 | 100 | 100 | Equilateral     |
| 5       | 5   | 10  | 10  | Isoceles        |

|    |  |    |     |    |                                     |
|----|--|----|-----|----|-------------------------------------|
| 6  |  | 10 | 10  | 5  | Isosceles                           |
| 7  |  | 10 | 5   | 10 | Isosceles                           |
| 8  |  | 2  | 3   | 4  | scalene                             |
| 9  |  | -1 | 5   | 10 | Not a triangle / Invalid            |
| 10 |  | 10 | -1  | 2  | <del>Not a triangle / Invalid</del> |
| 11 |  | 2  | 100 | -1 | Invalid / X                         |
| 12 |  | 20 | 20  | 20 | Equilateral                         |
| 13 |  | 7  | 8   | 9  | scalene                             |

Q#1

$$V(G) = E - N + 2P$$

$$\therefore N = 14, E = 15$$

$$\therefore V(G) = 15 - 14 + 2(1)$$

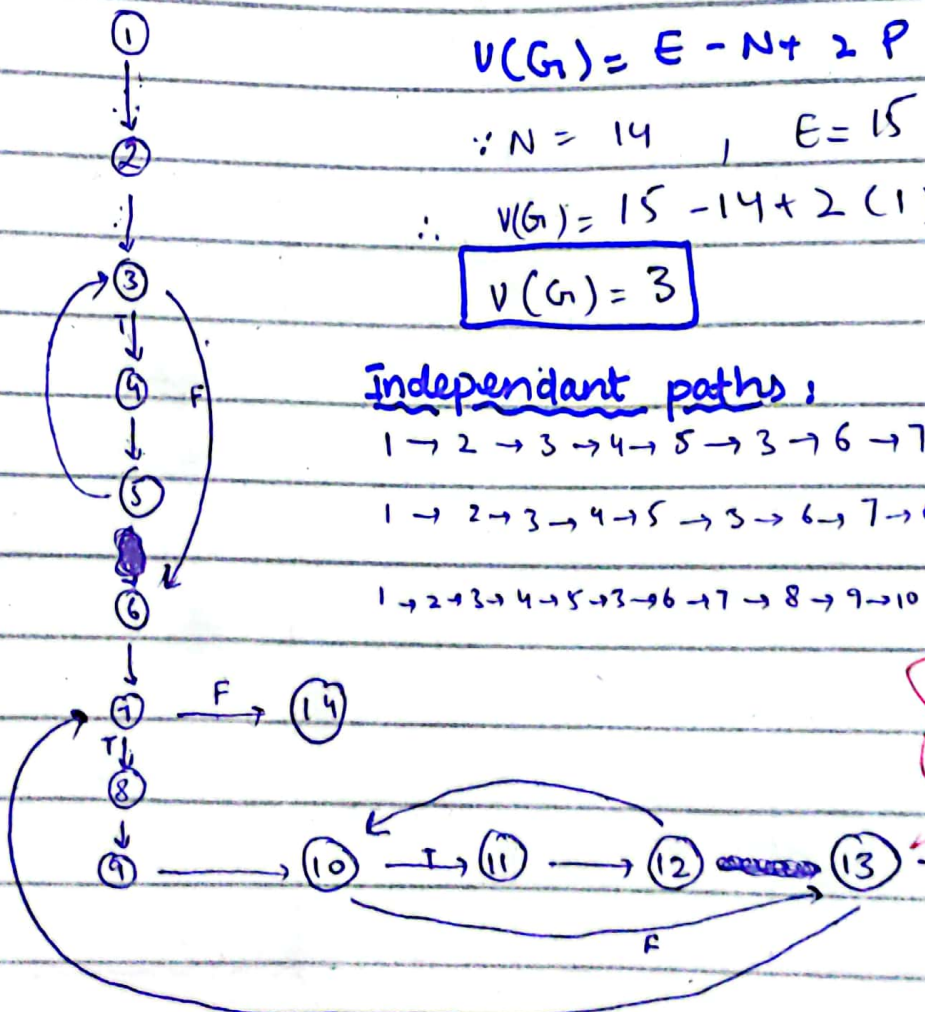
$$V(G) = 3$$

Independent paths:

1 → 2 → 3 → 4 → 5 → 3 → 6 → 7 → 14

1 → 2 → 3 → 4 → 5 → 3 → 6 → 7 → 8 → 9 → 10 → 13 → 7 → 14

1 → 2 → 3 → 4 → 5 → 3 → 6 → 7 → 8 → 9 → 10 → 11 → 12 → 10 → 13 → 7 → 14



8+1



# Q#3

multi-fault assumption

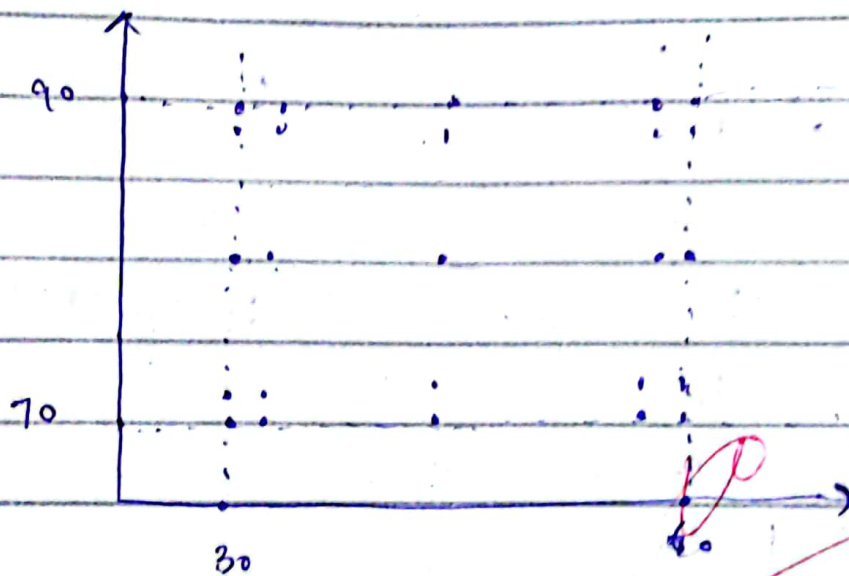
$$30 \leq \text{Metric} \leq 60$$

$$70 \leq \text{FSC} \leq 90$$

worst case: only valid values + ~~5128~~ multi-fault assumption

| Test ID | Metric                         | F <del>SC</del> | Expected output |
|---------|--------------------------------|-----------------|-----------------|
| 1       | <del>20</del> 30               | 70              | Eligible        |
| 2       | <del>30</del> <del>20</del> 30 | 71              | Eligible        |
| 3       | <del>85</del> <del>20</del> 30 | 80              | Eligible        |
| 4       | <del>20</del> 30               | 89              | Eligible        |
| 5       | <del>20</del> 36               | 90              | Eligible        |
| 6       | <del>30</del> 31               | 70              | Eligible        |
| 7       | <del>30</del> 31               | 71              | Eligible        |
| 8       | <del>30</del> 31               | 80              | Elig            |
| 9       | <del>30</del> 31               | 89              | Elig            |
| 10      | <del>30</del> 31               | 90              | Eligible        |
| 11      | 45                             | 70              | Eligible        |
| 12      | 45                             | 71              | Eligible        |
| 13      | 45                             | 80              | Elig            |
| 14      | 45                             | 89              | Eligible        |
| 15      | 45                             | 90              | Eligible        |
| 16      | 59                             | 70              | Eligible        |

|    |    |    |          |
|----|----|----|----------|
| 17 | 59 | 71 | eligible |
| 18 | 59 | 80 | eligible |
| 19 | 59 | 89 | eligible |
| 20 | 59 | 90 | eligible |
| 21 | 60 | 70 | eligible |
| 22 | 60 | 71 | eligible |
| 23 | 60 | 80 | eligible |
| 24 | 60 | 89 | eligible |
| 25 | 60 | 90 | eligible |





## Q#2

Worst robustness = Single fault assumption + Valid & Invalid values

$$30 \leq \text{Metric} \leq 60$$

$$70 \leq \text{FSC} \leq 90$$

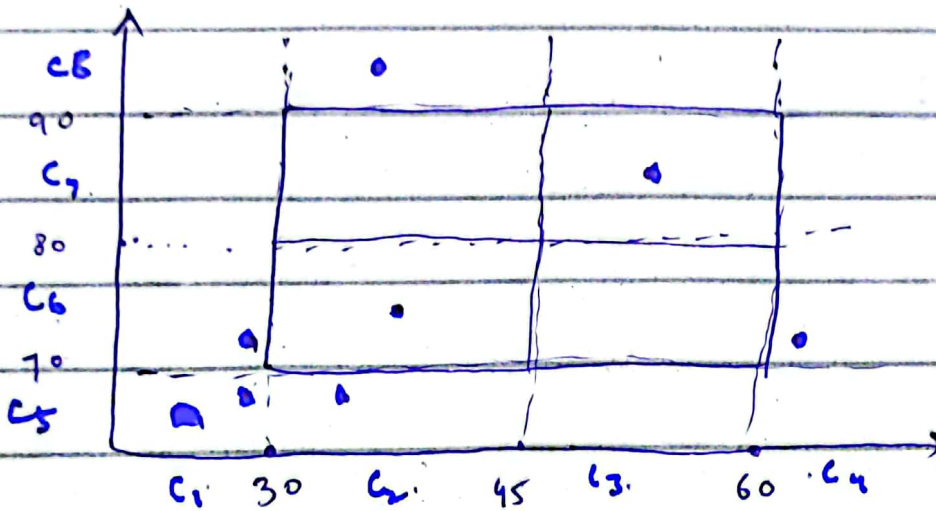
$$C_1: m < 30$$

$$C_5: \text{FSC} < 70$$

$$C_2: 30 \leq m \leq 45 \quad C_6: 70 \leq \text{FSC} \leq 80 \quad C_7: 70 \leq \text{FSC} \leq 90$$

$$C_4: m > 60 \quad C_3: 45 \leq m \leq 60$$

$$C_8: \text{FSC} > 90$$



| Test ID | Metric   | FSC      | Expected output |
|---------|----------|----------|-----------------|
| 1       | 29 $C_1$ | 71 $C_6$ | Not eligible    |
| 2       | 33 $C_2$ | 69 $C_5$ | Not eligible    |
| 3       | 61 $C_4$ | 71 $C_6$ | Not eligible    |
| 4       | 33 $C_2$ | 91 $C_8$ | Not eligible    |
| 5       | 29 $C_1$ | 69 $C_5$ | Not eligible    |
| 6       | 37 $C_2$ | 75 $C_6$ | Eligible        |
| 7       | 52 $C_3$ | 85 $C_7$ | Eligible        |
| 8       | 65 $C_4$ | 25 $C_8$ | Not eligible    |

Remainder of Q#4

| Test ID | a   | b   | c   | Expected Output |
|---------|-----|-----|-----|-----------------|
| 14      | 200 | 200 | 200 | Equilateral     |
| 15      | 100 | 101 | 102 | Scalene         |
| 16      | 100 | 102 | 102 | Eq. Isosceles   |
| 17      | 9   | 10  | 11  | Scalene         |
| 18      | -3  | 2   | -5  | Invalid         |
| 19      | 6   | 6   | 12  | Not a $\Delta$  |
| 20      | 15  | 7   | 8   | Not a $\Delta$  |
| 21      | 7   | 8   | 15  | Not a $\Delta$  |
| 22      | 101 | 101 | 101 | Equilateral     |
| 23      | 12  | 13  | 14  | Scalene         |
| 24      | 10  | 8   | 10  | Isosceles       |
| 25      | 7   | 3   | 10  | Not a $\Delta$  |