RYERSON UNIVERSITY

Faculty of Engineering, Architecture and Science

Department of Electrical and Computer Engineering

Course Number	891
Course Title	Software Testing and Quality Assurance
Semester/Year	W2023

Instructor	Dr. Reza Samavi

Lab No.	7

Lab Title	Logic Coverage

Submission Date	March 27th, 2023
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**By signing above you attest that you have contributed to this written lab report and confirm that all work you have contributed to this lab report is your own work.*

Q1: p = a ∧ (~b v c)

1.

Row #	**a**	**b**	**c**	**~b**	**~b v c**	**p = a ∧ (~b v c)**
1	T	T	T	F	T	T
2	T	T	F	F	F	F
3	T	F	T	T	T	T
4	T	F	F	T	T	T
5	F	T	T	F	T	F
6	F	T	F	F	F	F
7	F	F	T	T	T	F
8	F	F	F	T	T	F

2.

Clause 1: a --> p, regardless of the b or c values. If a is true, then p is true and vice versa if a is false then p is false.

Clause 2: ~b --> p, if (~b) is true, then p will imply true only when (a=T, b=F, c=F) and (a=T, b=F, c=T). All other cases are false.

Clause 3: c --> p, if c is true, then p implies true only when (a=T, b=F) and (a=T, b=T)

3.

GACC:

Major Clause	Set of possible tests
a	(1,5), (1.7), (1,8), (3,5), (3,7), (3,8), (4,5), (4,7), (4,8)
b	(2,4)
c	(1,2)

CACC:

Major Clause	Set of possible tests
a	(1,5), (1.7), (1,8), (3,5), (3,7), (3,8), (4,5), (4,7), (4,8)
b	(2,4)
c	(1,2)

RACC:

Major Clause	Set of possible tests
a	(1,5), (3,7), (4,8)
b	(2,4)
c	(1,2)

GICC:

Major Clause	Set of possible tests	
a	No feasible pairs for P = T	P = F: (2,6)
b	P = T(1,3)	P = F: (5,7), (6,8)
c	P = T(3,4)	P = F (5,6), (7,8)

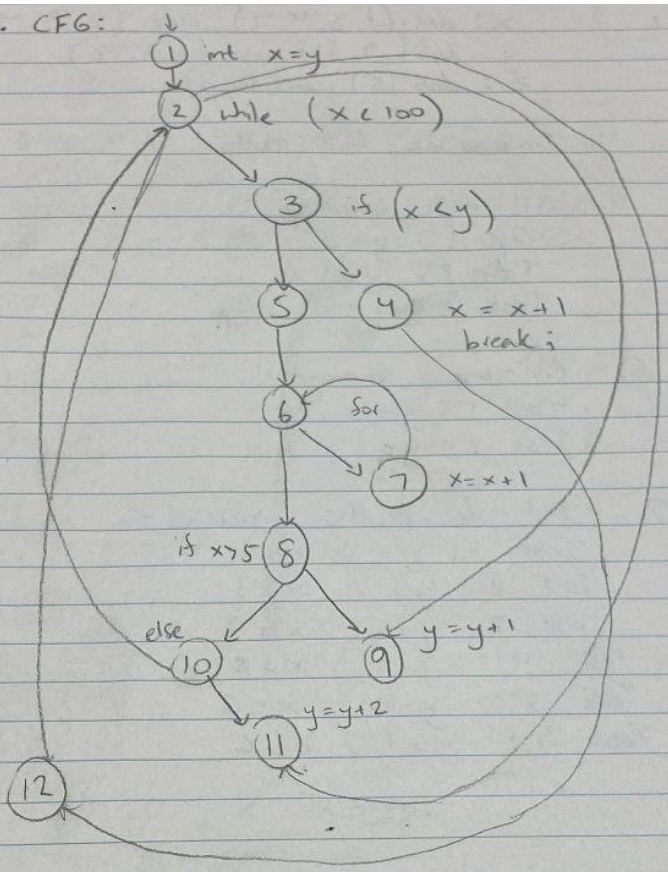
RICC:

Major Clause	Set of possible tests	
a	No feasible pairs for P=T	P = F:(2,6)
b	P = T: (1,3)	P = F: (5,7), (6,8)
c	P = T: (3,4)	P = F: (5,6), (7,8)

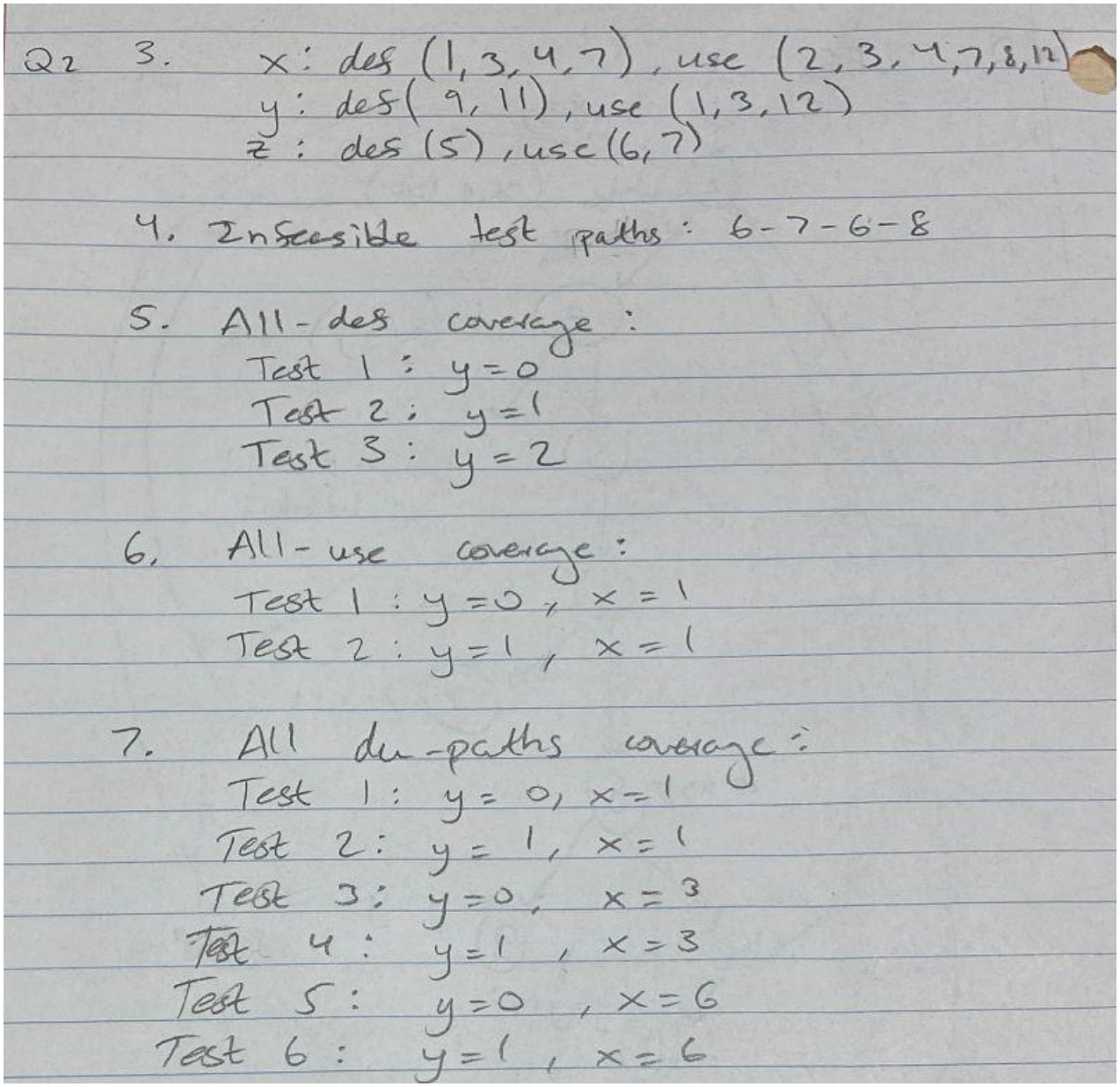
Q2:

Q2. CFG:

1.



Q2. 2. Node 1: def(x), use(y)
Node 2: use(x)
Node 3: use(x), use(y)
Node 4: use(x)
Node 5: def(z)
Node 6: use(z)
Node 7: def(x), use(x), use(z)
Node 8: use(x)
Node 9: def(y)
Node 10: None
Node 11: def(y)
Node 12: use(x), use(y)



Q3:

1. **Reachability Predicates:**
   Line 6: s1 <= 0, s2 <= 0, s3 <= 0
   Line 9: (s1 + s2 <= s3), (s1 + s3 <= s2), (s2 + s3 <= s1)

2. **Test cases that satisfy PC:**

   Test Case 1: (s1 = 0, s2 = 0, s3 = 0), expected output: invalid

Test Case 2: (s1 = 3, s2 = 4, s3 = 5), expected output: scalene
Test Case 3: (s1 = 3, s2 = 3, s3 = 3), expected output: equilateral

3. **Test cases that satisfy CC:**
   Test Case 1: (s1 = 1, s2 = 1, s3 = 5), expected output: isosceles
   Test Case 2: (s1 = 3, s2 = 4, s3 = 5), expected output: scalene
   Test Case 3: (sl = -2, s2 = 3, s3 = 5), expected output: invalid

4. **Determination predicates:**
   Line 12: (s2 == s3) && (s1 == s2)
   Line 15: (s2 == s3) || (s1 == s2) || (sl == s3)

5. **Test cases that satisfy CACC (or RACC):**
   Test Case 1: (s1 = 2, s2 = 2, s3 = 2), expected output: equilateral
   Test Case 2: (s1 = 2, s2 = 2, s3 = 4), expected output: isosceles
   Test Case 3: (s1 = 2, s2 = 3, s3 = 4), expected output: scalene

6. **Infeasible requirements:** None.