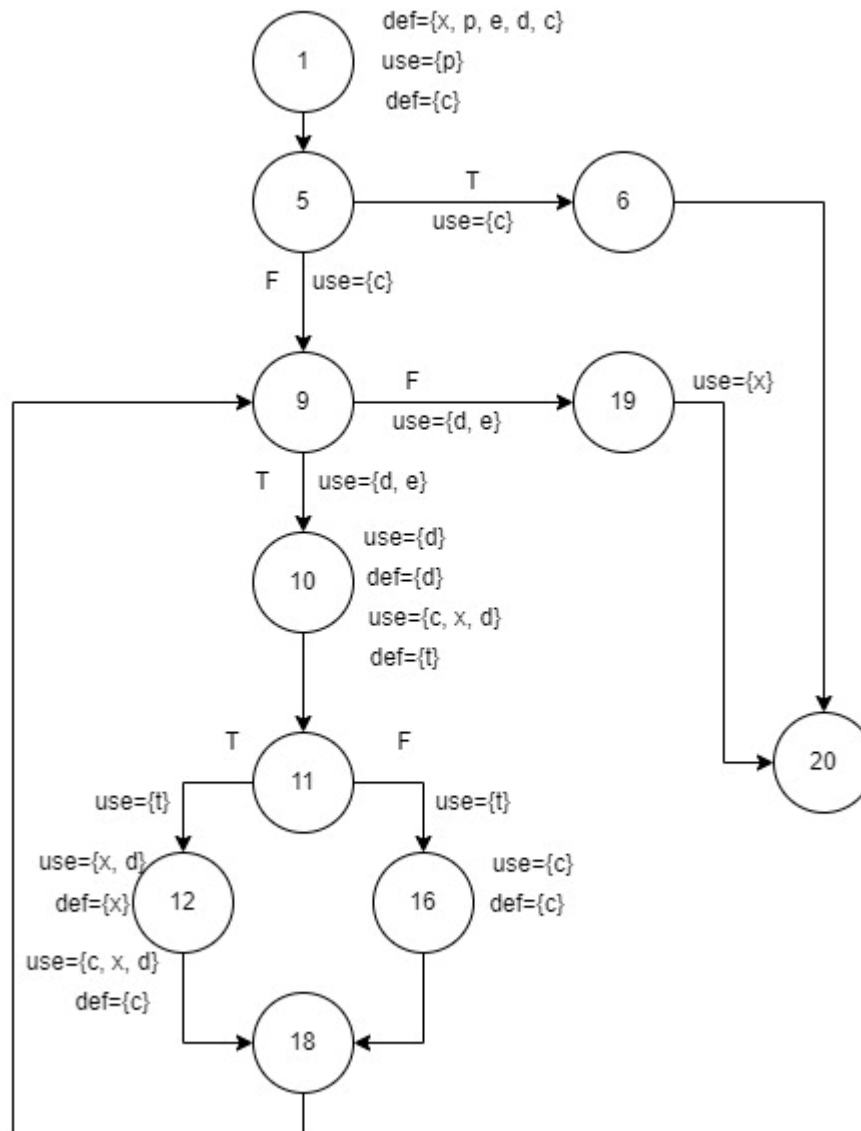


1.



2. A) Path is def-clear for x, y, count. Path is not def-clear for z.
- b) This is not a def-clear path since there are nodes that repeat. (5, 6).
- c) The path is def-clear for z as it is the only one defined in the initial node and not defined again within the path. Variable x at 12 needs to be greater than 0 in order to be there. But in order to reach 8, x must be ≤ 0 . Having both of these is impossible so the path can't be executed.
- d)

Variable Name	Defining Location	Use Location	Def-clear paths	Feasibility
x	1	6, 7	1, 5, 6, 7	Yes
		6, 12	1, 5, 6, 12	Yes
		12	1, 5, 6, 12	Yes
		14	1, 5, 6, 12, 14 1, 5, 6, 7, 8, 9, 14	Yes

			1, 5, 6, 7, 9, 14	
y	1	7, 8	1, 5, 6, 7, 8	Yes
		8	1, 5, 6, 7, 8	Yes
		7, 9	1, 5, 6, 7, 9	Yes
		14	1, 5, 6, 12, 14 1, 5, 6, 7, 8, 9, 14 1, 5, 6, 7, 9, 14	Yes
	14	7, 8	14, 16, 5, 6, 7, 8	Yes
		8	14, 16, 5, 6, 7, 8	Yes
		7, 9	14, 16, 5, 6, 7, 9	Yes
		14	14, 16, 5, 6, 12, 14 14, 16, 5, 6, 7, 8, 9, 14 14, 16, 5, 6, 7, 9, 14	Yes
z	1	8	1, 5, 6, 7, 8	Yes
		14	1, 5, 6, 7, 9, 14	Yes
		18	1, 5, 6, 7, 9, 14, 16, 18	Yes
	8	8	8, 9, 14, 16, 5, 6, 7, 8	Yes
		14	8, 9, 14	Yes
		18	8, 9, 14, 16, 18	Yes
	12	8	12, 14, 16, 5, 6, 7, 8	No
		14	12, 14	Yes
		18	12, 14, 16, 18	Yes
count	1	14	1, 5, 6, 12, 14 1, 5, 6, 7, 9, 14 1, 5, 6, 7, 8, 9, 14	Yes
		16, 5	None since it has to go through 14	n/a
		16, 18	None since it has to go through 14	n/a
	14	14	14, 16, 5, 6, 12, 14 14, 16, 5, 6, 7, 8, 9, 14 14, 16, 5, 6, 7, 9, 14	Yes
		16, 5	14, 16, 5	Yes
		16, 18	14, 16, 18	Yes

e)

requirements: { [1, 5, 6, 12, 14], [1, 5, 6, 7, 8, 9, 14], [1, 5, 6, 7, 9, 14, 16, 18],
[14, 16, 5, 6, 7, 8], [14, 16, 5, 6, 12, 14], [14, 16, 5, 6, 7, 8, 9, 14], [14, 16, 5, 6, 7, 9, 14],
[8, 9, 14, 16, 5, 6, 7, 8], [8, 9, 14, 16, 18],
[12, 14, 16, 5, 6, 7, 8], [12, 14, 16, 18] }
(covers smaller paths in these as well)

t1 = [1, 5, 6, 12, 14, 16, 5, 6, 7, 8, 9, 14, 16, 18]

t2 = [1, 5, 6, 7, 8, 9, 14, 16, 5, 6, 12, 14, 16, 5, 6, 7, 8, 9, 14, 16, 5, 6, 7, 9, 14]

t3 = [1, 5, 6, 7, 9, 14, 16, 18]

t4 = [1, 5, 6, 12, 14, 16, 5, 6, 7, 8, 9, 14, 16, 5, 6, 7, 8, 9, 14, 5, 6, 12, 14, 16, 18]

f) Test paths from e also work for this.

3. a) The test suite is adequate for all-state criterion as just test case 1 and 2 reach all 3 states. All transitions criterion is also met with these test case because of the following:

- Q1q2 – test case 1 & 2
- Q2q1 – test case 1
- Q1q3 – test case 3 & 4
- Q2q3 – test case 2
- Q3q1 – test case 3
- Q3q2 – test case 4

b)

	a	b	ab	ba	aa	bb
Q1	1	1	11	10	10	11
Q2	0	1	01	10	01	11
Q3	0	1	01	11	00	11

Input sequence aa is a characterization sequence as all output sequence are different.