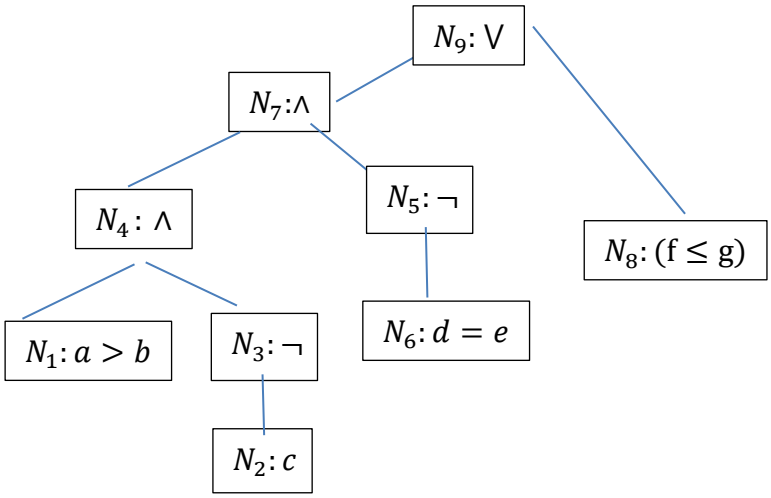
1. a) We need a test case in which x = y and x + y is not equal to x * y. Such a case can be x=3, y=3, or x=-1, y=-1.
b) Again, we need a test case in which x = y and x + y is not equal to x * y. Such a case can be x=3, y=3 or x=-1, y=-1
c) Again, we need a test case in which x = y and x + y is not equal to x * y. Such a case can be x=3, y=3 or x=-1, y=-1

2. $(a > b) \wedge \neg c \wedge \neg(d = e) \vee (f \leq g)$



$\boldsymbol{S_{N1}^T} = \{>\}, \boldsymbol{S_{N1}^F} = \{=, <\}, \quad \boldsymbol{S_{N2}^T} = \{\boldsymbol{T}\}, \boldsymbol{S_{N2}^F} = \{\boldsymbol{F}\}, \quad \boldsymbol{S_{N3}^T} = \{\boldsymbol{F}\}, \boldsymbol{S_{N3}^F} = \{\boldsymbol{T}\}$

$\boldsymbol{S_{N4}^T} = \boldsymbol{S_{N1}^T} \otimes \boldsymbol{S_{N3}^T} = \{> \boldsymbol{F}\}, \boldsymbol{S_{N4}^F} = (\boldsymbol{S_{N1}^F} \times \{\boldsymbol{t_{N3}}\}) \cup (\{\boldsymbol{t_{N1}}\} \times \boldsymbol{S_{N3}^F}) = \{= \boldsymbol{F}, < \boldsymbol{F}, > \boldsymbol{T}\}$

$\boldsymbol{S_{N6}^T} = \{=\}, \boldsymbol{S_{N6}^F} = \{<, >\}, \quad \boldsymbol{S_{N5}^T} = \{<, >\}, \boldsymbol{S_{N5}^F} = \{=\}$

$\boldsymbol{S_{N7}^T} = \boldsymbol{S_{N4}^T} \otimes \boldsymbol{S_{N5}^T} = \{> \boldsymbol{F} <, > \boldsymbol{F} >\}, \boldsymbol{S_{N7}^F} = (\boldsymbol{S_{N4}^F} \times \{\boldsymbol{t_{N5}}\}) \cup (\{\boldsymbol{t_{N4}}\} \times \boldsymbol{S_{N5}^F}) = \{= \boldsymbol{F} <, < \boldsymbol{F} <, > \boldsymbol{T} <, > \boldsymbol{F} =\}$

$\boldsymbol{S_{N8}^T} = \{<, =\}, \boldsymbol{S_{N8}^F} = \{>\}$

$\boldsymbol{S_{N9}^F} = \boldsymbol{S_{N7}^F} \otimes \boldsymbol{S_{N8}^F} = \{= \boldsymbol{F} <>, < \boldsymbol{F} <>, > \boldsymbol{T} <>, > \boldsymbol{F} =>\}$

$\boldsymbol{S_{N9}^T} = (\boldsymbol{S_{N7}^T} \times \{\boldsymbol{f_{N8}}\}) \cup (\{\boldsymbol{f_{N7}}\} \times \boldsymbol{S_{N8}^T}) = \{> \boldsymbol{F} <>, > \boldsymbol{F} >>, = \boldsymbol{F} <<\}$

b.
t_1:{ a=1, b=1, c=F, d=0, e=1, f=1, g=0, ER=False },
t_2:{ a=0, b=1, c=F, d=0, e=1, f=1, g=0, ER=False },
t_3:{ a=1, b=0, c=T, d=0, e=1, f=1, g=0, ER=False },
t_4:{ a=1, b=0, c=F, d=0, e=0, f=1, g=0, ER=False },
t_5:{ a=1, b=0, c=F, d=0, e=1, f=1, g=0, ER=True },
t_6:{ a=1, b=0, c=F, d=1, e=0, f=1, g=0, ER=True },
t_7:{ a=0, b=0, c=F, d=0, e=1, f=0, g=1, ER=True }

3. a) T= { t_1: (a=2, b=0, x=4)} will cover all the statements.
b) t_2: (a=1, b=1, x=0) will add decision coverage.
c) t_1 and t_2 also have condition coverage

4.

LCSAJ	**Start**	**End**	**Jump**
1	1	3	11
2	11	11	Exit
3	1	6	3
4	3	3	11
5	1	5	7
6	7	8	3
7	3	6	3
8	3	5	7

t_1: { a=5, b=5} will cover LCSAJs 1,2
t_2: { a=6, b=2} will cover LCSAJs 3, 7, 4, 2
t_3: { a=2, b=6} will cover LCSAJs 5, 6, 8, 6, 4, 2