

1.) a.) $P \rightarrow Fq$

If P is true, then q will also be true at some point in the future

b.) $G F P$
 \rightarrow 'P is infinitely true'

c.) $F G P$
 \rightarrow ~~Eventually~~
 Eventually $G P$ will be true forever.

d.) $\text{true} \cup q$
 \rightarrow true until 'q'

e.) $\neg(F \neg P)$
 \rightarrow P is always true.

2.) $\text{red} = r$
 $\text{green} = g$
 $\text{yellow} = y.$

a) $\Box \Diamond g$

b) $\Box (g \Rightarrow \text{or})$

c) $\Box (r \Rightarrow \Diamond g).$

3.

a. Rewrite “ $p \text{ R } q$ ” using negation and the **Until** operator

$\neg q \text{ U } p$

B. What is the semantic meaning of “**false** $\text{R } p$ ”?