

### **Solution to Example in your text book.**

You need to find your glasses and you try to think back to where they could be in order to locate them.

- a) If my glasses are on the Kitchen table, then I saw them at breakfast.
- b) I was reading the newspaper in the living room or I was reading in the kitchen.
- c) If I was reading the newspaper in the living room, then my glasses are on the coffee table.
- d) I did not see my glasses at breakfast.
- e) If I was reading my book in bed, then my glasses are on the bed table.
- f) If I was reading the newspaper in the kitchen, then my glasses are on the kitchen table.

### **Solution and write up:**

The symbolic logic for the above statements is given below.

All statement are considered to be true.

- a)  $T \rightarrow B$ , T: glasses on kitchen table, B: saw them at breakfast
- b)  $L \vee K$ , L: reading in the living room, K: reading in the kitchen
- c)  $L \rightarrow C$ , C: glasses on the coffee table
- d)  $\sim B$
- e)  $O \rightarrow E$ : O: reading in bed, E: glasses on bed table
- f)  $K \rightarrow T$

“I did not see my glasses at breakfast “ is a true statement. Since the implication  $T \rightarrow B$  is a true statement and the necessary condition B is false, the sufficient condition T must also be false; so my glasses are not on the kitchen table. If my glasses are not on the kitchen table and  $K \rightarrow T$  is a true implication, then by the same reasoning as before we have that K must be false and I was not reading the newspaper in the kitchen. Since I was not reading in the kitchen and  $L \vee K$  is a true statement and K is false, then L must be true, and I was reading in the living room. Since I was reading in the living room is the sufficient condition for the true implication,  $L \rightarrow C$ , then the necessary condition C is also true and my glasses are on the coffee table.