

2.20 A DJ (“disc jockey,” meaning someone who plays the music at a party) would like a system to automatically control a strobe light and disco ball in a dance hall depending on whether music is playing and anyone is dancing. Assume we have a sound sensor with output S that indicates whether music is playing ($S=1$ means music is playing) and a motion sensor M that indicates whether people are dancing ($M=1$ means people are dancing). The strobe light has an input L that turns the light on when L is 1, and the disco ball has an input B that turns the ball on when B is 1. The DJ wants the disco ball to turn on only when music is playing and nobody is dancing, and the DJ wants the strobe light to turn on only when music is playing and people are dancing. Using AND, OR, and NOT gates, create a simple digital circuit to activate: (a) the disco ball, and (b) the strobe light.

