Exercise 2.7:

Determine a four bar mechanism for a safety window of a hospital. Starting to the closed position, the window must allow a safety open position for ventilating and taking up a minimum space in the room. A third position must allow cleaning the external face of the glass.

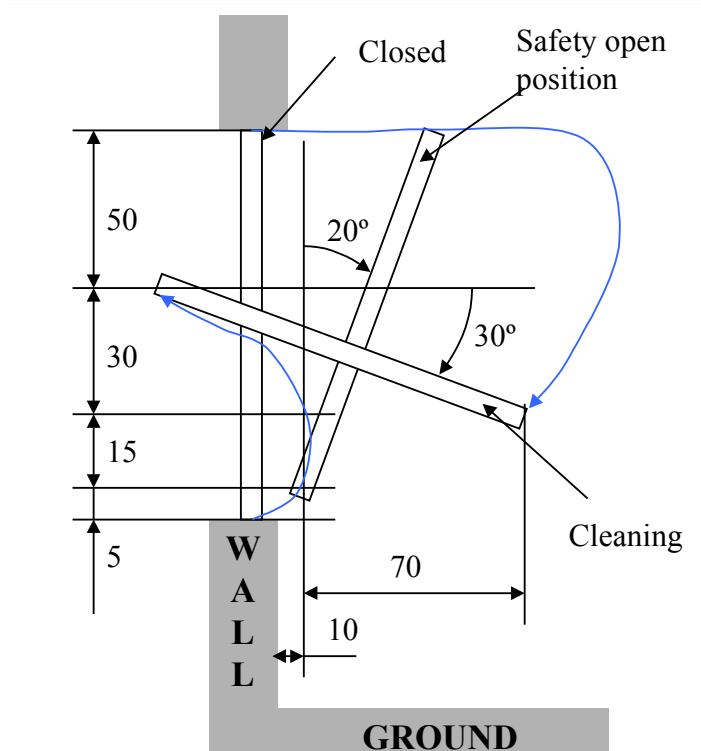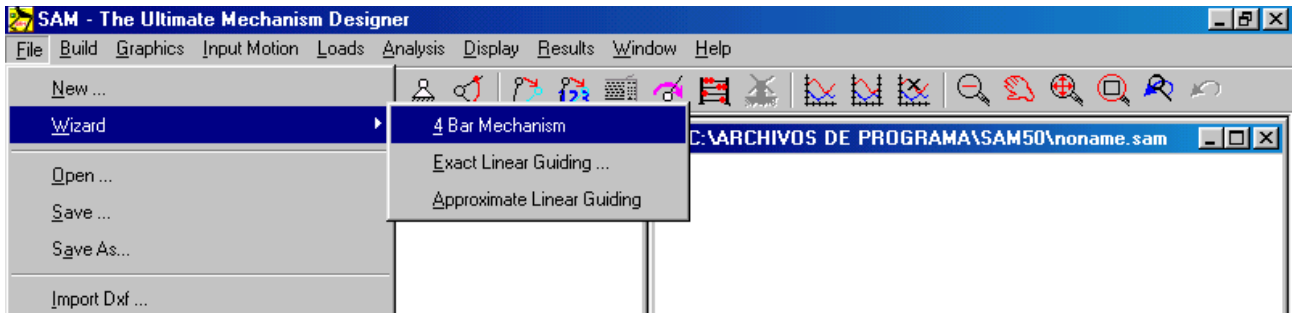The three described positions are shown in the figure E3.1.

Figure E3.1. Safety window of a hospital- .

Solution:

a) The synthesis of mechanism will be solved using the SAM PC v5.0 program which applies the before delivered technique.

As shown in before Exercises, *"Wizard"* menu will be used for the synthesis of the mechanism:

We choose the "4 Bar Mechanism" option, and the "3-Position Synthesis (II)" flap. Then the following form appears:

Figure E3.2.- Data input for the synthesis of the mechanism.

Now it is necessary to fill the coordinates of the mobile links A and B of the mechanism. As shows figure E3.3.-, the mobile links of the mechanism may be any points near of the window, not necessary the end point of the window. After some attempts, we can try with the shown data in the Figure E3.2.- The result is shown in Figure E3.4.-
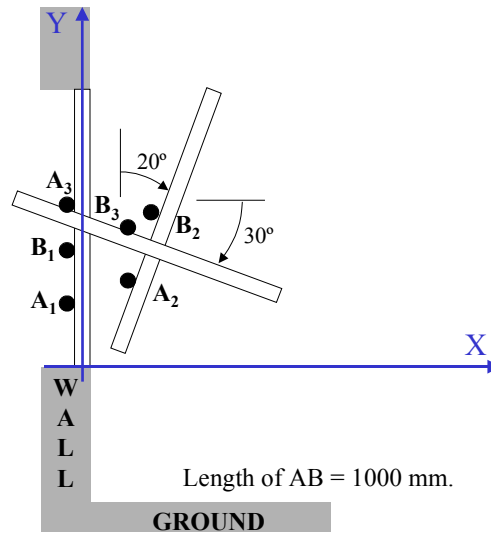
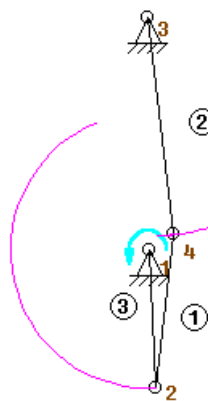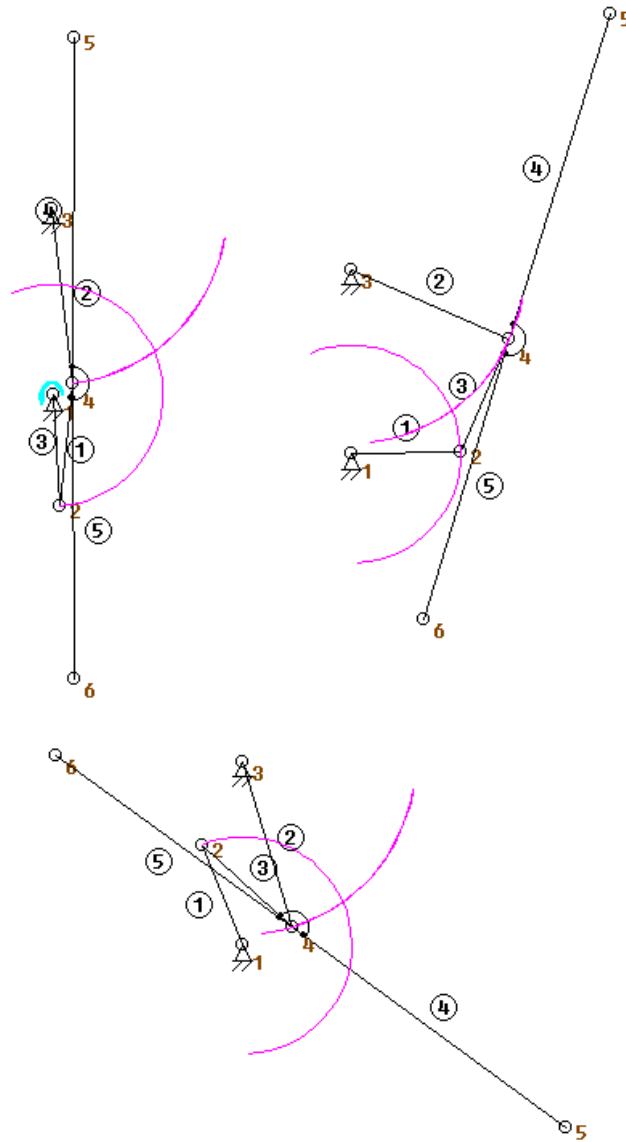Figure E3.3.- Precision position for the mobile links of the mechanism.

Figure E3.4.- First result after the input data that is shown in figure E3.2.

Then we can modify the motion of the mechanism in the opposite direction. Then, also we can add some bars as the window. The Figure E3.5.- shows the final solution, displaying the three precision position for the exercise.

a) Closed position.   b) Safety ventilation position.   c)   Cleaning position.

Figure E3.5.- Final solution. Three precision position for the exercise.