PLC Exercise Sheet no.1

(1) For the ladder diagram shown in Figure (1), if X0 is given as shown, draw the corresponding timing diagram of Y0 and write the corresponding logic instruction program

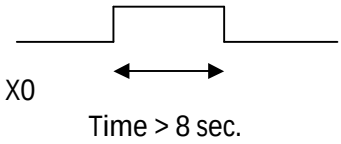
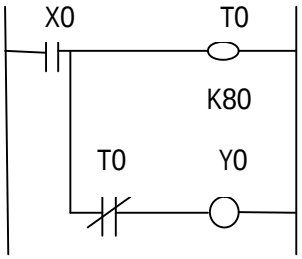


Figure (1)



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(2) For the ladder diagram shown in Figure (2), write the corresponding logic instruction program and draw the timing diagrams of M0, M11 and Y0 for the shown X0.

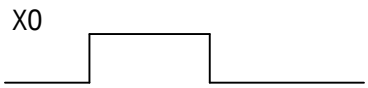
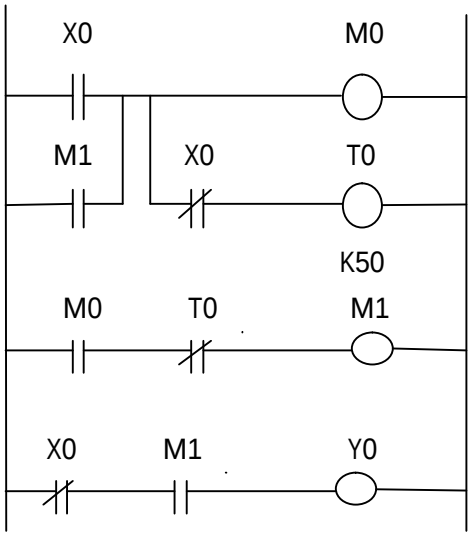


Figure (2)



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(3) For the ladder diagram shown in Figure (3), write the corresponding logic instruction program and draw the timing diagrams of M2 and Y0 for the shown X1, X2 and X3.

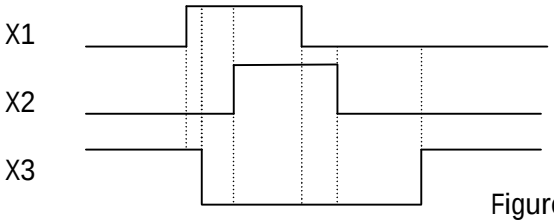
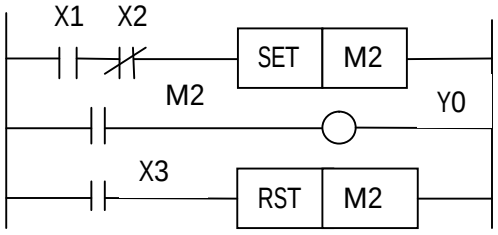


Figure (3)



(4) Draw a ladder diagram in which Y0 is activated when X0 becomes ON and deactivated after a delay of 20 sec. timed from the moment when X0 becomes OFF. Write the corresponding logic instruction program.

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(5) Draw a ladder diagram that has 3 inputs X1, X2 and X3 and one output Y1. This output should be activated when exactly 2 out of the 3 inputs become ON and deactivated otherwise. Write the corresponding logic instruction program.

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(6) Draw a ladder diagram so that the behavior of X0 and X1, shown in Figure (4), results in the shown change of Y0. Note that the shown behavior is repeatable. Write the corresponding logic instruction program.

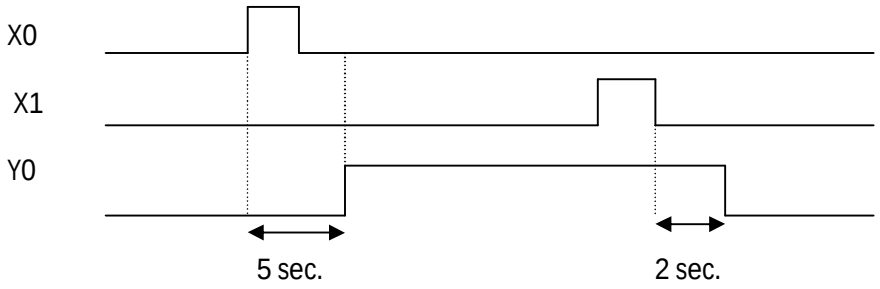

Figure (4)

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(7) Draw a ladder diagram in which a load Y1 is activated if a pushbutton X1 is continuously pressed without interruption for at least 5 seconds. If the pushbutton is continuously pressed for less than 5 seconds, the load is not activated. To deactivate Y1, another pushbutton X2 should be pressed while X1 is not pressed. Write the corresponding logic instruction program.

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(8) For the ladder diagram shown in Figure (5), draw the timing diagram of Y1 for the shown X1 and X2. Write the corresponding logic instruction program.

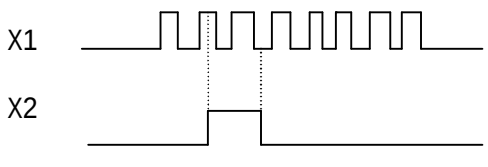
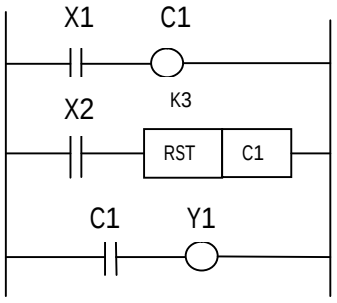


Figure (5)



(9) Draw a ladder diagram in which an output Y2 is activated for 20 minutes if a pushbutton X1 is pressed then released 5 times and kept pressed for at least 3 seconds in each time.

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(10) Draw ladder diagrams that satisfy the repeatable timing behavior shown in Figures (6-a) and (6-b). Write the corresponding logic instruction programs.

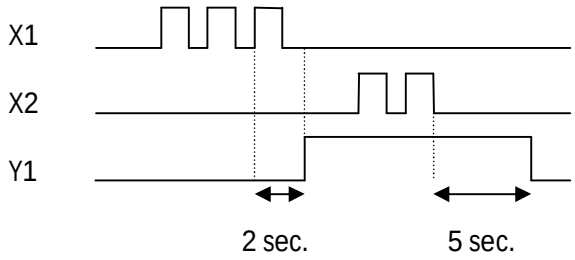

Figure (6-a)

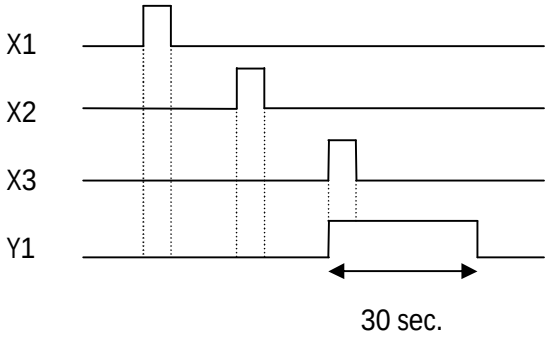

Figure (6-b)