

Course Title: Automated Industrial System

Course Code: EE512

Sheet #1

Try to design the power and control circuits using relay logic (hardwire) mentioning all the devices used for the following applications:

- 1- 3 phase induction motor operated by one start and one stop push button.
- 2- 3 phase induction motor operated in the right direction by pressing the right push button and operating in the left direction by pressing the left push button. Pushing the stop push button will stop the motor completely.
- 3- DC motor operated by one start one stop push button.
- 4- DC motor operated in the right direction by pressing the right push button and operating in the left direction by pressing the left push button. Pushing the stop push button will stop the motor completely.
- 5- Start/Stop a 3 phase induction motor from two locations (local-remote). Each location has a start and stop push button.
- 6- 3 phase induction motor operated by one start and one stop push button while applying the following sequence after pressing the start push button:
 - i- Rotating clockwise direction for 5 sec
 - ii- Stop for 2 sec
 - iii- Rotate anti-clockwise for 5 sec
 - iv- Stop the operation until another pressing to the start push button

If the stop push button is pressed at any time the motor should be completely stopped.

- 7- Try to design a control system for automatic liquid pouring system described by the schematic diagram in **Fig.1**. The control objective is described as:
 - i- After starting operation a conveyor belt moves the transfer bottle under the filling tank
 - ii- Amount of liquid is automatically poured from the tank into the container.
 - iii- After the filling operation, the conveyor moves again to transfer another bottle and so on.

Take:

Input 1: Start push button

Input 2: Stop push button

Input 3: Sensor

Output 1: Conveyor drive motor

Output 2: Valve.

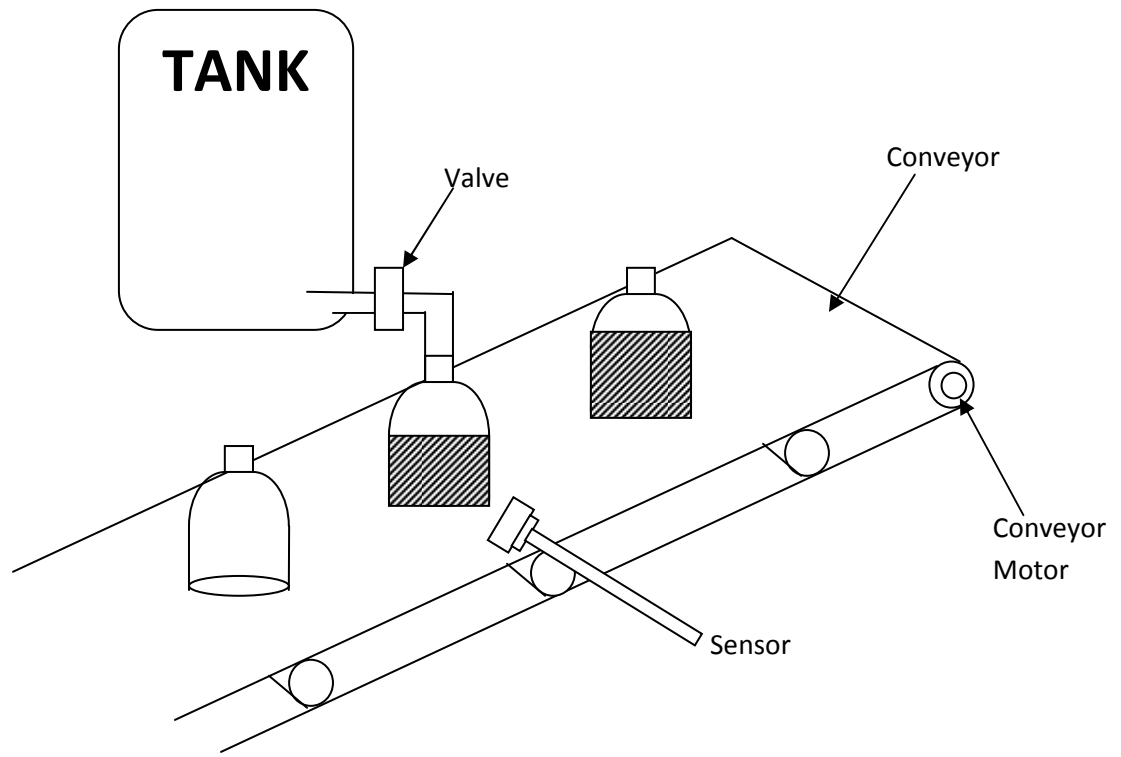


Fig.1.