IQRA National University, Peshawar   Name: **Fawad Ahmad**
Department of Electrical Engineering
Spring 2020   REG.No   **13204**

Industrial Electronics
Assignment

Question No 1.   Multiple choice Questions

1.   Does the severity of an electric shock increase or decrease with each of the following changes?

a. A decrease in the source voltage **(Increase)**

b. An increase in body current flow

(Increase)

 c. An increase in body resistance

(Decrease)

d. A decrease in the length of time of exposure **(Decrease)**

2.   State the piece of electrical safety equipment that should be used to perform each of the following tasks:

a. A switching operation where there is a risk of injury to the eyes or face from an electric arc. **(Safety Glasses)**

b. Using a multimeter to verify the line voltage on a 3-phase 480 volt system

(Safety gloves, safety shoes, safety hat)

c. Opening a manually operated high-voltage disconnect switch. (**Safety gloves, safety shoes, safety hat)**

3.   In which industrial revolution the use of IT and Electronic systems further automated the production of industrial sector

a. First.

b. Second.

   ✓ c,Third.

c. Fourth.

4.   Industrial safety is primarily a management activity which is concerned with _____, Controlling, Eliminating hazards from the industries.

   ✓ a, Reducing

b, Increasing

c, suppressing

The _____ is defined as the device which convert the one form of energy into another form of the energy.

a. Sensor

  ✓ <mark>Transducer</mark>

b. Resistor

c. Capacitor

IQRA National University, Peshawar
Department of Electrical Engineering
Spring 2020

Name: **FAWAD AHMAD**

REG.No: **13204**

Industrial Electronics
Assignment

**Question No 2**   10

   A. Draw digital logic circuit and ladder diagram that is equivalent to the following
      Boolean function that will initiate a motor "M" to start? (10) **CLO-2**

   M= B'C D' + B'C E + B'C F'

Question No 3   10

   A. Describe and draw ladder diagram for the below given process having a container infused
      with liquids A and B in order when START is pressed. When it reaches the set level, mix the
      two liquids evenly then open the valve to let out the mixture? **CLO-2**
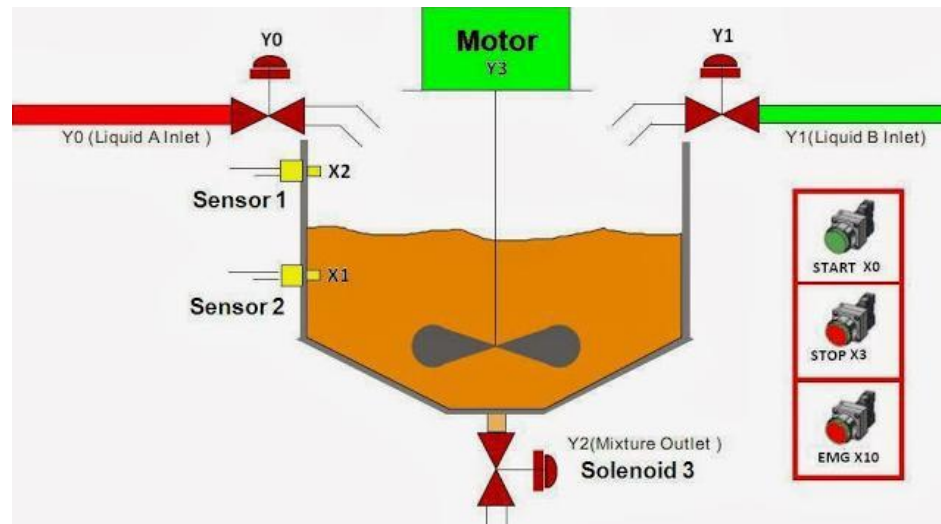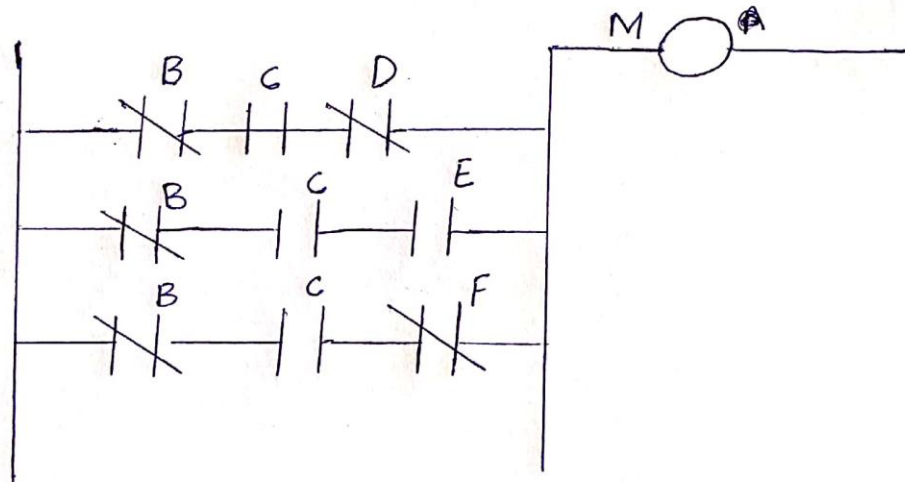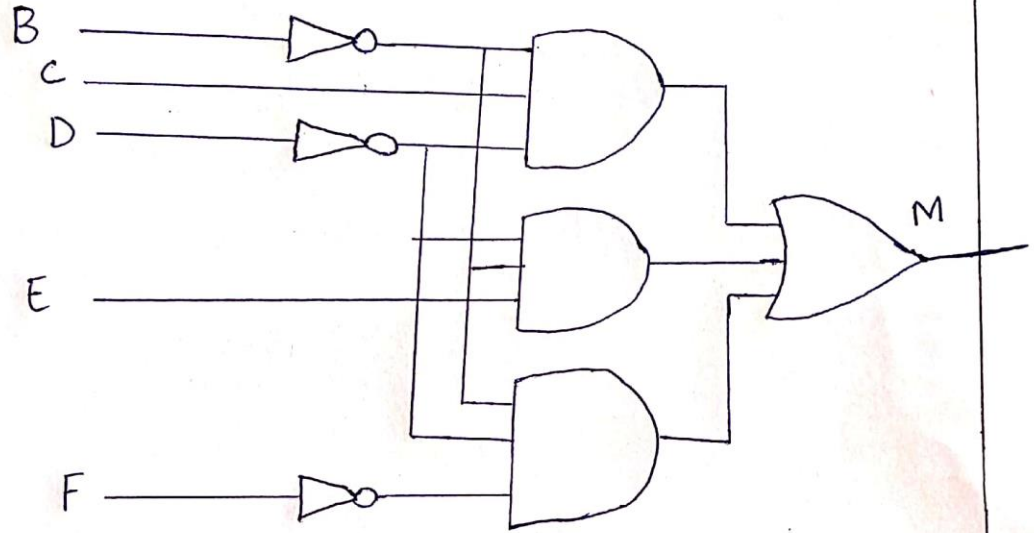

.Good Luck

Q2:-

$$M = B \cdot C \cdot D + B \cdot C \cdot E + B' C' F$$

Sol :-

Q 3 A :-

Answer :-

(★) **Number of PLC Input Required :-**

X1 — Start Switch

X1 — Low level float Sensor. X1 = ON When the liquid level reaches X1.

X2 — High level float Sensor. X2 = ON When the liquid level reaches X2.

X10 — Emergency Stop Button. X10 = ON When the Button is Pressed.

(★) **Number of PLC output Required :-**

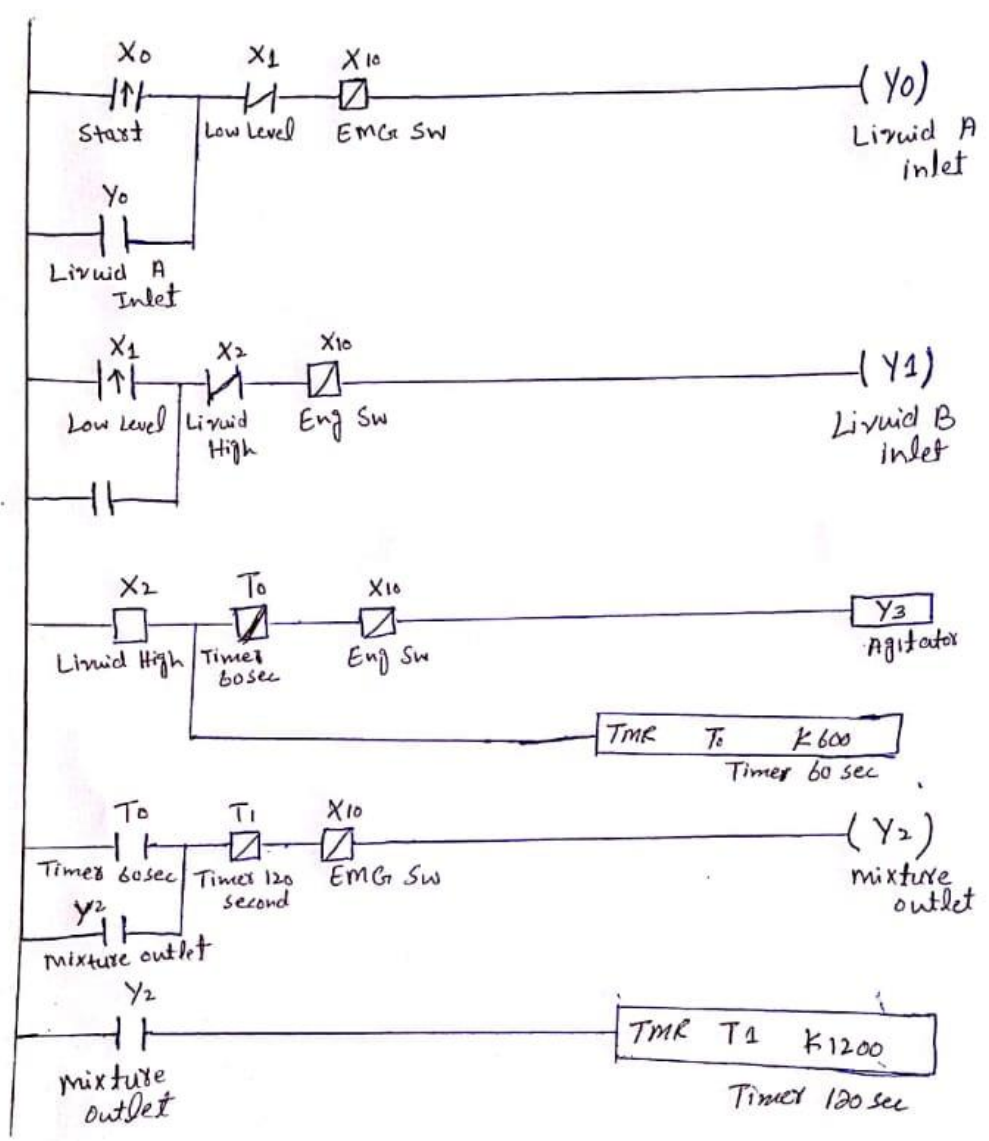Y0 = Liquid A inlet

Y1 = Liquid B Inlet

Y2 = Mixture Outlet

Y3 = Agitator / Stirrer

(★) **Number of PLC Timer Required :-**

→ T0 — 60 Second , 100 ms Time Base (See K60 Preset Value For Timer)

→ T1 — 120 Second Timer , 100ms Time Base (See K1200 Present Val, For Timer.

Ⓐ **PLC Ladder Diagram:-**

Ⓐ **Ⓑ PLC Ladder Diagram Description:-**

→ ~~PLC~~ X0 = ON when Start is Pressed. Y0 will be ON and latched and the valve will be opened for infusing liquid

A until the level reaches the low-level Float Sensor

→ X_1 = ON When the level reaches the low level Float Sensor Y_1 will be ON and latched, and the Valve will be opened for infusing liquid B until the level reaches the high level Float Sensor.

→ X_2 = ON When the level reaches the high level Float Sensor. Y_3 will be ON and Activates the Agitator. Also Timer T_0 will Start to Count for 60 Sec. After 60 sec T_0 will be ON. and the Agitator motor Y_3 will Stop working.

→ When Y_2 = ON timer T_1 will Start to Count for 120 sec. After 120 sec T_1 will be ON and Y_2 will be OFF. The draining process will be stopped.

→ When an error occures, Press Emergency Stop Button X_{10}. The Hc Contact X_{10} will be ON to disable all the outputs.
The System will then Stop running.