IQRA National University, Peshawar **Name: Farhan shah**
Department of Electrical Engineering
Spring 2020 **REG.No:13180**

Industrial Electronics
Assignment

Question No 1. <u>Multiple choice Questions</u>

1. Does the severity of an electric shock increase or decrease with each of the following changes? a. A decrease in the source voltage

b. An increase in body current flow

c. An increase in body resistance

d. A decrease in the length of time of exposure

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.

b. Using a multimeter to verify the line voltage on a 3-phase 480 volt system. c. Opening a manually operated high-voltage disconnect switch.

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.

d. 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

b. Transducer

c. Resistor

c. Capacitor

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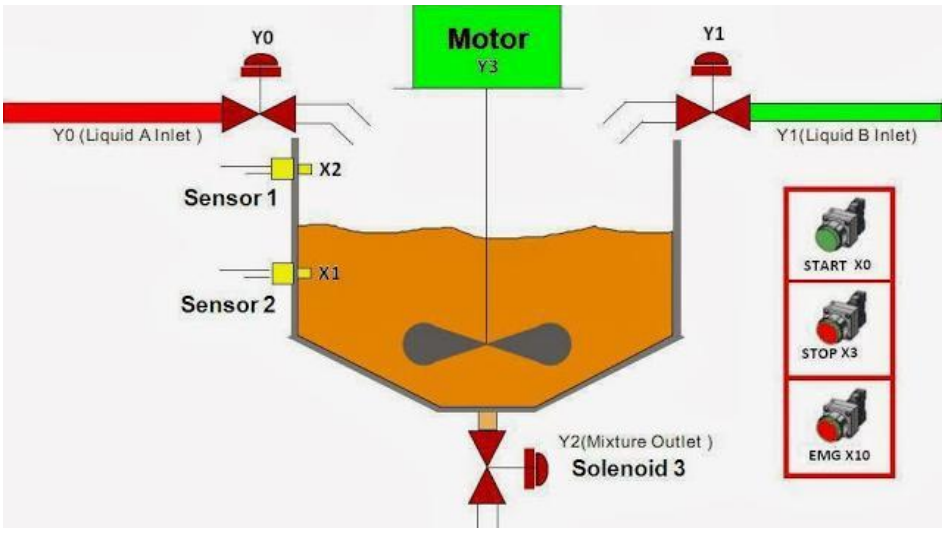
Question No 2 10

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**



Question No 1.

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

a. A decrease in the source voltage.

b. An increase in body current flow.

c. An increase in body resistance.

d. A decrease in the length of time of exposure.

Answer:

(D)

Q2:

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.

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

C. Opening a manually operated high voltage disconnect switch.

Answer:

(c)

Q3: In which industrial revolution the use of IT and Electronic systems further automated the production of industrial sector.

a. First.

b. Second.

c. Third.

d.fourth

Answer:

(C)

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

a. Reducing

b. Increasing

c. suppressing

Answer:

(A)

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

a. Sensor

b. Transducer

c. Resistor

c. Capacitor

Answer:

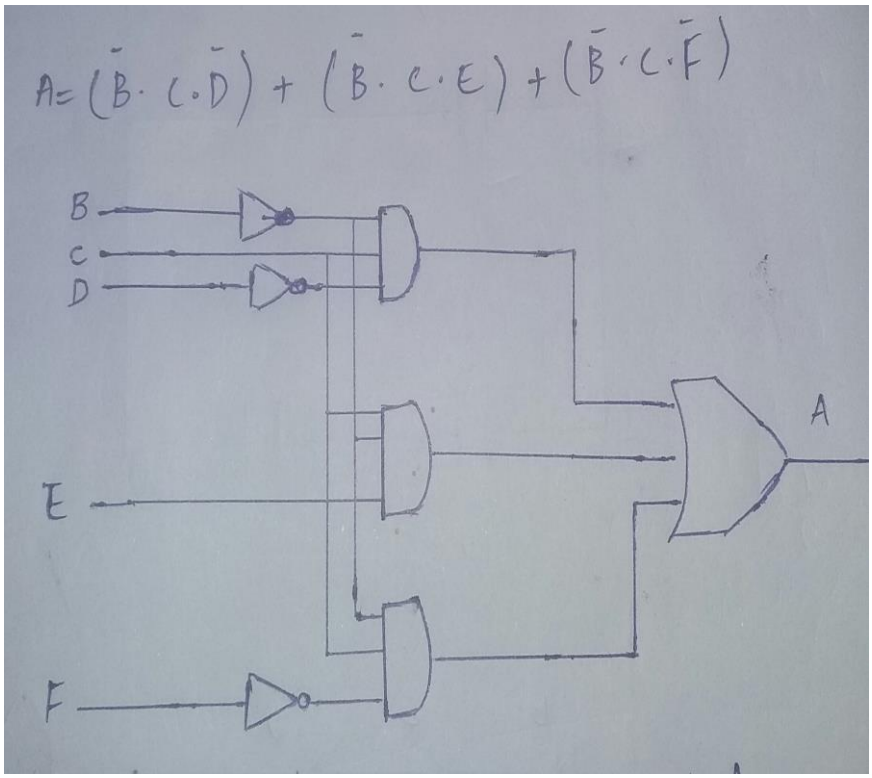
(B)

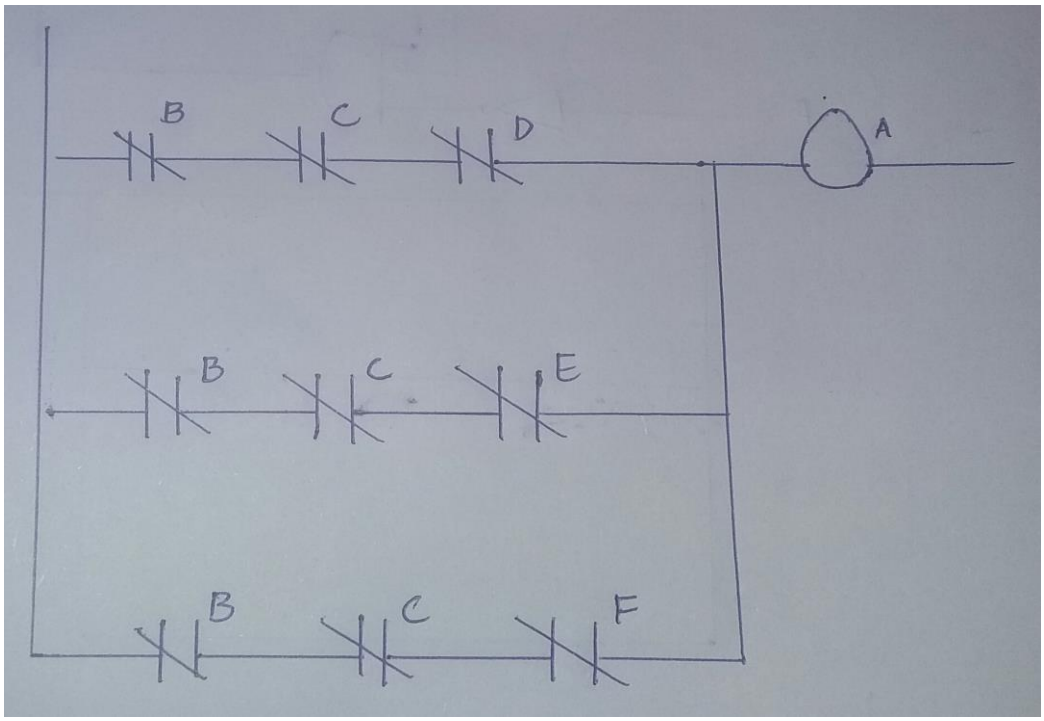
Question No 2:

A. Draw digital logic circuit and ladder diagram that is equivalent to the following Boolean function that will initiate a motor “M” to start?

M= B’C D’ + B’C E + B’C F’

Answer:





Question No 3:

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?

Answer:
Automatically infusing the container with liquids A and B in order when is pressed. When it reaches the set level mix the two liquids evenly open the valve to let out the mixture.

Ladder program description:

1. X0=on when start is pressed. Y0 will be ON and latched and valve will be opened for infusing liquid A until the level reaches the low- level float sensor.
2. X1=ON when the level reaches the low –level float sensor Y1 will be ON and latched and the valve will be opened for infusing liquid B until the level reaches the high –level float sensor.
3. X2=ON when the level reaches the high- level float sensor .Y3 will be ON and activates the agitator .Also timer TO will start to count for 60sec. After 60 sec. TO

will be ON and the agitator motor Y3 will stop working. Y2 will be ON and latched and the mixture will drain out of the container.

4. When Y2 =ON timer T1 will start to count for 120sec. T1 will be ON and Y2 will be off the draining process will be stopped.

When an error occurs press emergency stop button X10. The NC contact X10 will be ON to disable all the outputs. The system will stop running.

Number of Plc. inputs required:

1) X1- start switch.
2) X1- low level float sensor. X1=ON when the liquid level reaches X1.
3) X2- high level float sensor .X2=ON when the liquid level reaches X2.
4) X3-stop switch.
5) X10-emergency stop button .X10=ON when the button is pressed.

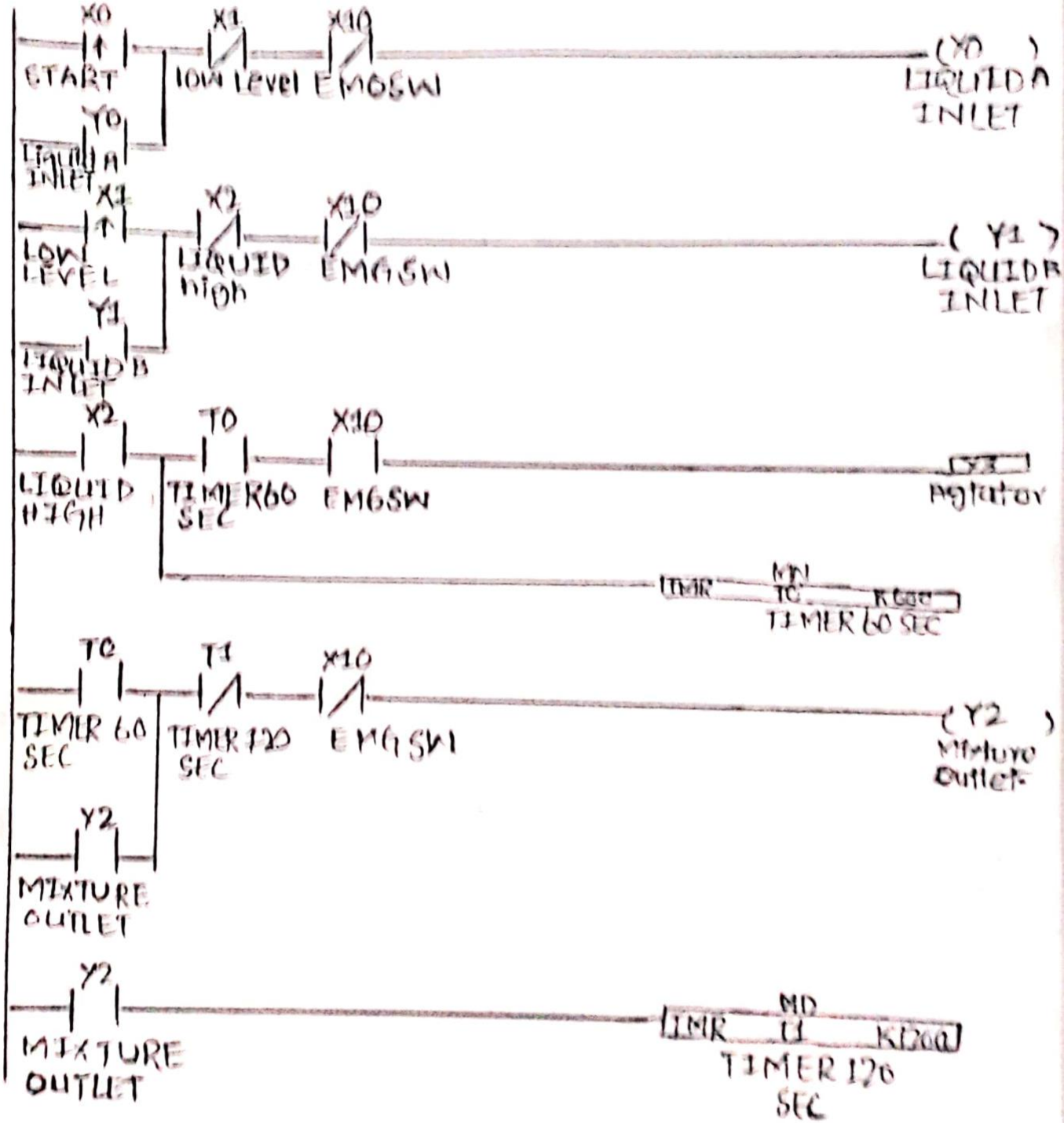
Number of PLC output Required:

I. Y0-liquid A inlet.
II. Y1-Liquid B inlet.
III. Y2-Mixture outlet.

Y3-Agitator/stirrers

Number of PLC timer required:

T0-60sec. timer base (sec K60 preset value for timer).
T1-120sec. timer base (sec K1200 preset value for timer)


X0
START
X1
LOW LEVEL
X10
EMGSW
Y0
LIQUID A INLET
(Y0)
LIQUID A INLET
X1
LOW LEVEL
X2
LIQUID HIGH
X10
EMGSW
Y1
LIQUID B INLET
(Y1)
LIQUID B INLET
X2
LIQUID HIGH
T0
TIMER 60 SEC
X10
EMGSW
Y3
Agitator
TMR T0 K600
TIMER 60 SEC
T0
TIMER 60 SEC
T1
TIMER 120 SEC
X10
EMGSW
Y2
MIXTURE OUTLET
Y2
MIXTURE OUTLET
Y2
MIXTURE OUTLET
TMR T1 K1200
TIMER 120 SEC