



**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
 - 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



**Industrial Electronics
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Question No 2

10

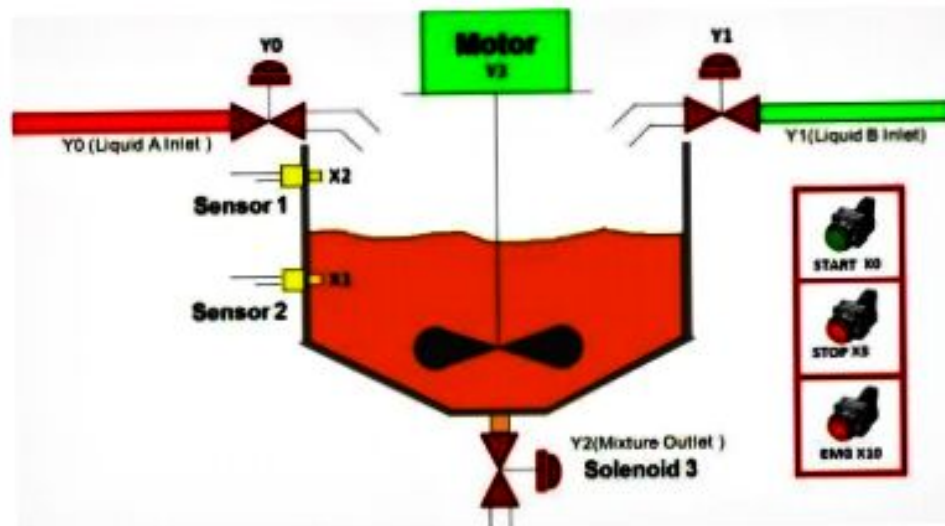
- A. Draw digital logic circuit and ladder diagram that is equivalent to the following Boolean function that will initiate a motor "M" to start? (10) CLO-2

$$M = B'C'D' + B'CE + B'CF$$

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.

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Subject : Industrial Electronics

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①

Question # 01

① Does the severity of an electric shock increase or decrease with each of the following change

Answer:

- a) Increase
- b) Increase
- c) Decrease
- d) Decrease

2) State the piece of electrical safety equipment that should be used to perform each of the following task

Ans:

- a) Safety glasses
- b) safety gloves, safety shoes, safety hat
- c) safety gloves, safety shoes & hat

3) In which industrial revolution the use of IT and electronic system further automated the production of industrial sector

Ans: (Third)

4) Industrial safety is primarily a management activity which is connected with reducing controlling
Eliminating hazards from the industries

Ans:

(Reducing)

5) The Transducer is defined as the device which convert the one form of energy into another form of energy

Ans:

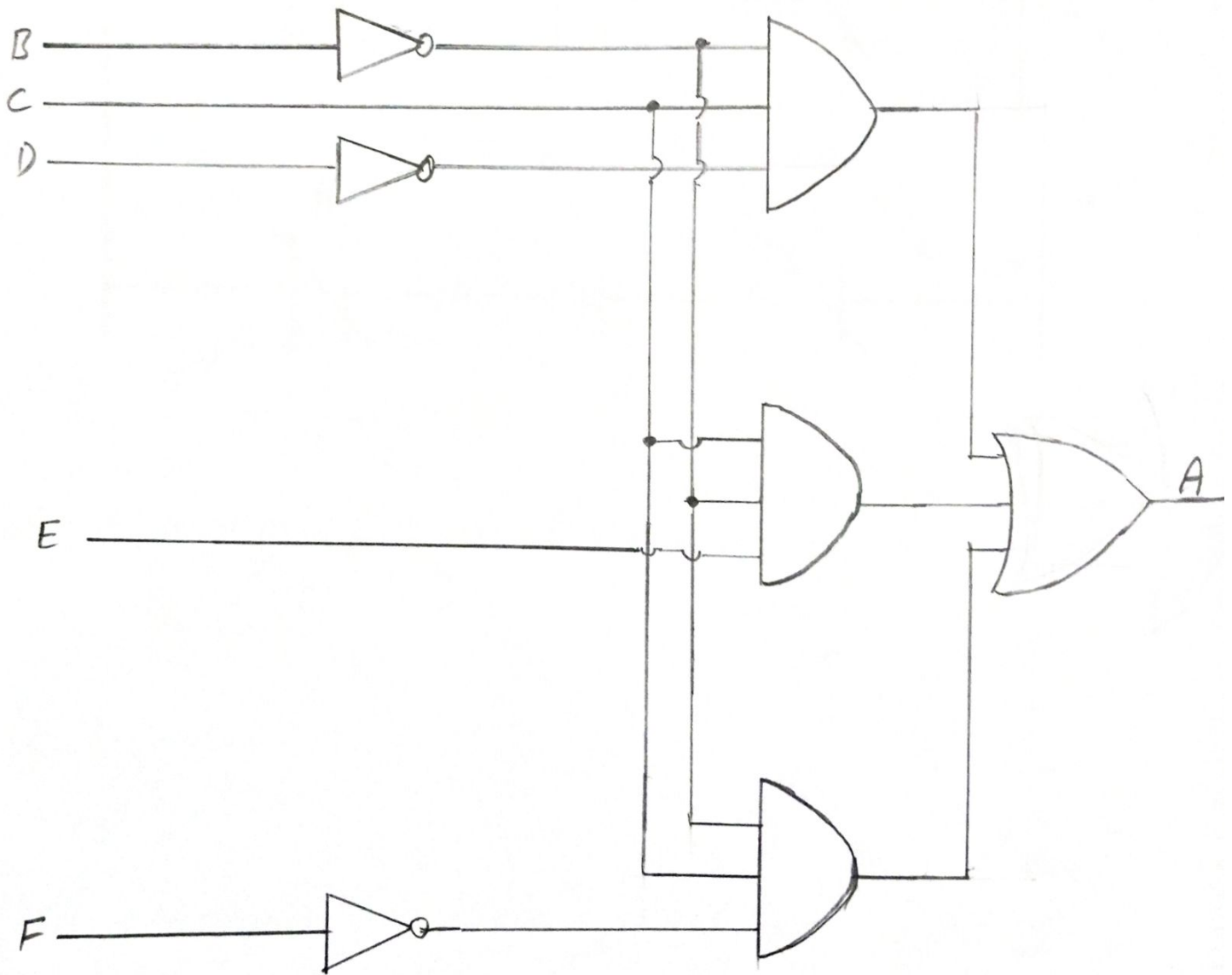
(Transducer)

Question #02

Draw digital logic circuit and ladder diagrams that is equivalent to the following Boolean function that will initiate motor M to start?

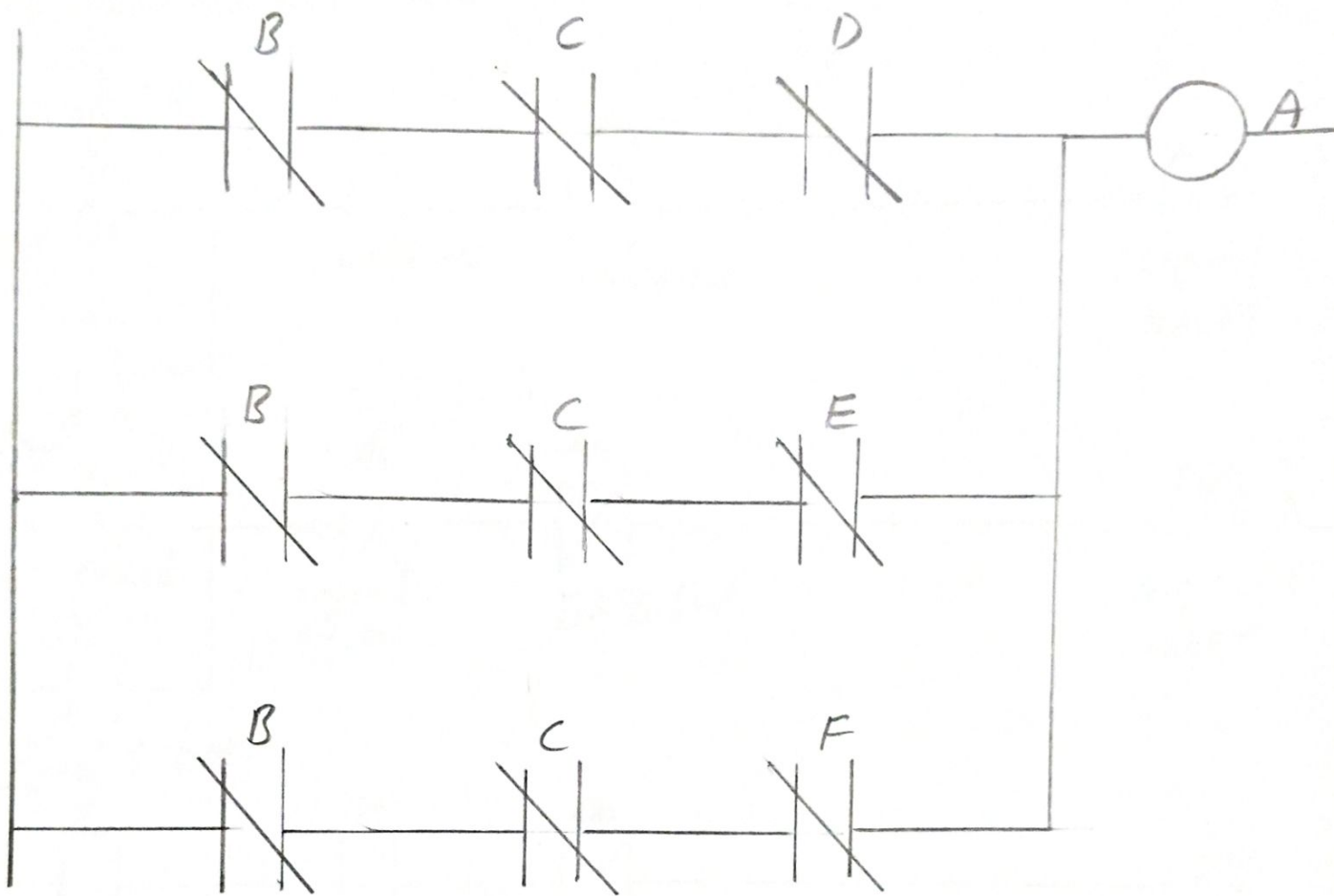
Ans: $M = BCD + BCE + BCF$

(Digital Logic Circuit)



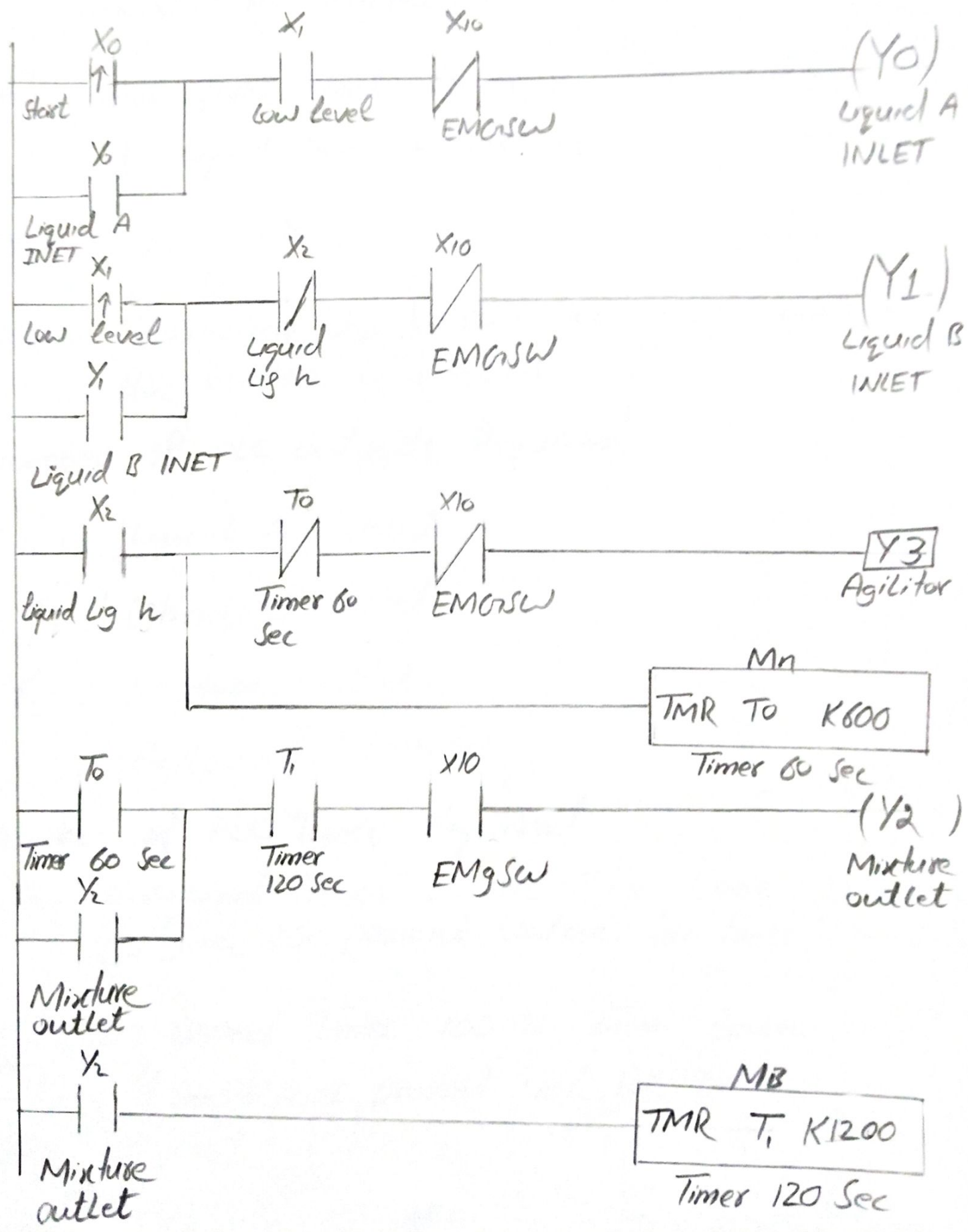
(4)

Ladder Diagram:-



5

Describe and draw ladder diagram for given process having container infused ?



Number of PLC Inputs Required:-

$\Rightarrow X_1$ - is start switch

$\Rightarrow X_2$ - low level float sensor $X_1 = ON$ when the liquid level reaches X_1

$\Rightarrow X_3$ - High Level float sensor $X_2 = ON$ when the liquid level reduce X_2

$\Rightarrow X_4$ - Stop switch

$\Rightarrow X_{10}$ - Emergency stop button $X_{10} = ON$ when the button is pressed

Number of PLC outputs Required

$\Rightarrow Y_0$ - Liquid A Inlet

Y_1 - Liquid B Inlet

Y_2 - Mixture outlet

Y_3 - Agilator/stirrer

Number of PLC Timer Required

$\Rightarrow T_0$ - 60 Second Timer 100 ms Time Base
[see K60 present value for Timer]

$\Rightarrow T_1$ - 120 Second Timer 100 ms Time Base
[see K1200 present val for Timer]

Ladder Program Description:- (7)

$\Rightarrow X_0 = ON$ when START is pressed Y_0 will be ON and latched, and the ~~the~~ valve will be opened for infusing liquid A until the level reaches the low level Float Sensor

$\Rightarrow X_1 = ON$ when the level reaches the Low level float sensor. X_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

$\Rightarrow X_2 = ON$ when the level reaches the high level float sensor X_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 Y_2 will be ON and latched and the mixture will drain out of container

(8)
⇒ 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 occurs, press 'Emergency Stop' button X_{10} . The NC contact X_{10} will be ON to disable all the outputs. The system will then stop running.