School: SOE	Level: BE	Invigilator's Sign: ……………..
Program: BEEE	Year/Part: IV/I	Superintendent's Sign: …………
Subject: SCADA and PLC in Industrial Automation (EG723EE/EX)		Code No. …………………………

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i.   Answers should be given by filling the Multiple-Choice Questions' Answer Sheet.
ii. The main answer sheet can be used for rough work.

Code No. [   ]

GROUP A *(Multiple-Choice Questions)*	[10x1=10]	Time: 20 Minutes

1. Industrial automation primarily aims to
a) Increase manual labor
c) **Improve efficiency and consistency**
b) Reduce productivity
d) Eliminate all machines

2. Which of the following is NOT a basic component of industrial automation?
a) Sensors
c) Actuators
b) Controllers
d) **Whiteboards**

3. The PLC operates in:
a) Sequential Logic
c) Boolean Logic
b) **Computer Logic**
d) Communication algorithm

4. Which of the following is a type of PLC model?
a) **Main PLC**
c) Modular PLC
b) Desktop PLC
d) Network PLC

5. Which of these is a graphical PLC programming language?
a) Assembly
c) C++
b) **Ladder Logic**
d) Python

6. In a PLC, a latch instruction is used for
a) Start a motor
c) Count pulses
b) **Maintain output ON even after input is released**
d) Reset timers

7. An NO contact in PLC logic means:
a) **Normally Open**
c) New Output
b) Non-Operational
d) Null Operation

8. Which device converts mechanical movement into electrical pulses for PLC input?
a) Sensor
c) Transducer
b) **Encoder**
d) Actuator

9. HMI stands for:
a) Human Mechanical Integration
c) High Motor Input
b) **Human Machine Interface**
d) Hardware Management Indicator

10. The full form of RTU in SCADA is:
a) Remote Transfer Unit
c) **Remote Terminal Unit**
b) Real-Time Utility
d) Regional Transformer Unit

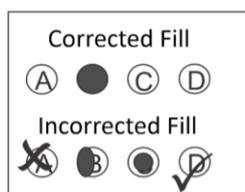---

Multiple Choice Questions' Answer Sheet

Marks Secured: _____

In Words: _____

Examiner's Sign: _____ Date: _____

Scrutinizer's Marks: _____

In Words: _____

Scrutinizer's Sign: _____ Date: _____

Corrected Fill
Ⓐ ● Ⓒ Ⓓ

Incorrected Fill
✗ Ⓑ ● ✓

1.	Ⓐ Ⓑ Ⓒ Ⓓ	6.	Ⓐ Ⓑ Ⓒ Ⓓ
2.	Ⓐ Ⓑ Ⓒ Ⓓ	7.	Ⓐ Ⓑ Ⓒ Ⓓ
3.	Ⓐ Ⓑ Ⓒ Ⓓ	8.	Ⓐ Ⓑ Ⓒ Ⓓ
4.	Ⓐ Ⓑ Ⓒ Ⓓ	9.	Ⓐ Ⓑ Ⓒ Ⓓ
5.	Ⓐ Ⓑ Ⓒ Ⓓ	10.	Ⓐ Ⓑ Ⓒ Ⓓ

School: SOE	Level: BE	Time: 3 Hours
Program: BEEE	Year/Part: IV/I	Full Marks: 50
Subject: **SCADA and PLC in Industrial Automation (EG723EE/EX)**		

✓ *Candidates are required to give their answers in their own words as far as practicable.*
✓ *The figures in the margin indicate **Full Marks**.*
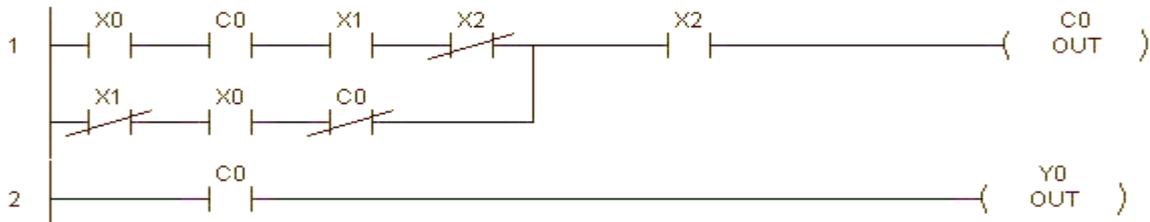✓ *Assume suitable data if necessary.*

GROUP A *(Multiple-Choice Questions in separate paper)*　　　　　　　　　　　**[10×1=10]**

GROUP B *(Short Answer Questions - **Attempt Any Eight**)*　　　　　　　　　　**[8×2=16]**

1. Differentiate between hardwired relay logic and PLC-based automation.

2. Write equivalent assembly code for the ladder diagram below.

3. Explain with an example how a timer is used in a PLC program.

4. Why is latching important in industrial control circuits?

5. Explain the importance of data handling in HMI systems.

6. State two limitations of a centralized SCADA architecture compared to a distributed one.

7. Write the advantages of automation in industrial processes.

8. Explain the Scan Cycle used by PLC.

9. Write two functions of an operator panel in HMI.

GROUP C *(Long Answer Questions - **Attempt Any Six**)*　　　　　　　　　　**[6×4=24]**

1. Explain the architecture of a PLC with a neat block diagram and describe the function of each part.

2. Develop a ladder logic diagram for controlling a motor with Start/Stop push buttons, including latching, electrical and thermal overload protection.

3. Write Stage, Grafcet and Ladder Diagram for an automatic door capable of automatically opening on sensing object near the door. The door should close automatically if it does not sense any object near it for five seconds.

4. Explain the components of a SCADA system with a suitable diagram.

5. Explain the Concept of Sourcing and Sinking in PLC, with proper diagrams and examples.

6. In an industrial mixing plant for food products, the temperature and mixing speed have to be maintained at a certain point. Recommend proper sensors and actuators to monitor and achieve the desired results, and explain how the sensors are interfaced with the PLC.

7. Describe the different types of SCADA architectures with proper figures.

All The Best