Roll No…….. **Total No. of Printed Pages: 02**

Total No. of Questions: [09]

B. Tech. (ME) (Semester – 5th/6th/8th)
INDUSTRIAL AUTOMATION
Subject Code: BECEO1004
Paper ID: [18OE112325]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(2 marks each)**

Q1. Attempt the following:

a. Define "Automation".
b. Which type of protocol is used for communication between devices over a serial connection?
c. What is Profinet? How it is different from Ethernet/IP?
d. Name the sensor used for measuring relative humidity? Mention its application in industry.
e. What is MMI? Briefly explain its significance?
f. State any two differences between IoT and I2oT.
g. Draw any two symbols each for inputs and outputs used in PLC ladder logic programming.
h. Name any two industrial communication protocols used for connecting automation equipment.
i. What is meant by a smart actuator?
j. Draw the truth table and PLC ladder logic diagram for XOR gate.

Section – B **(5 marks each)**

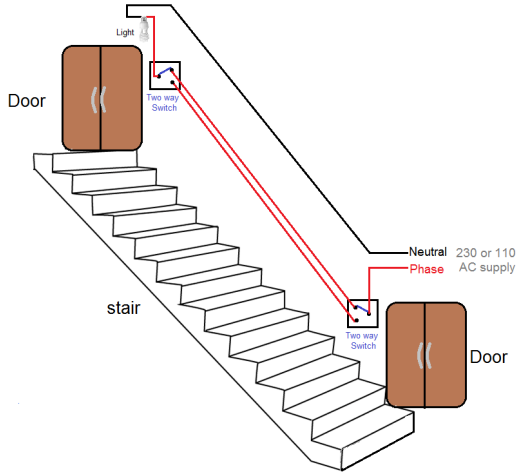
Q2. Enlist any five common types of input and output devices used in PLC (Programmable Logic Controller) systems.

Q3. Draw the block diagram of generic PLC showing typical functional blocks and their purpose.

Q4. State any five advantages of PLC logic over Relay logic.

Q5. Compare and contrast AC and DC drives in industrial applications. Mention the factors that make AC drives more preferred than DC drives in modern industry, with a focus on maintenance, efficiency, and control features.

Q6. Draw the PLC ladder logic diagram for a two way switch stair-case light?



Section – C **(10 marks each)**

Q7. Explain the importance of integrating Distributed Control Systems (DCS) with Programmable Logic Controllers (PLCs) and computer systems in industrial applications. Mention the benefits, challenges, and methods involved in achieving such integration. Illustrate with examples from real-world applications to support your answer.

Q8. Explain the basic construction and configuration of Pick and Place Robot.

Q9. Write short notes on any two of the following:

a) State any five differences between PLC logic and Hardwired logic.

b) Advantages of DCS

c) Robots are mostly preferred in paint shops and wielding. Justify