



U.S.N 

--	--	--	--	--	--	--	--	--	--

**P.E.S. College of Engineering, Mandya - 571 401**

*(An Autonomous Institution affiliated to VTU, Belgaum)*

**Sixth Semester, B.E. - Electrical and Electronics Engineering**

**Semester End Examination; June - 2016**

**Programmable Logic Controller and SCADA**

Time: 3 hrs

Max. Marks: 100

**Note:** Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.

**UNIT - I**

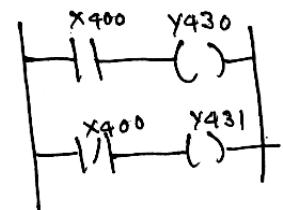
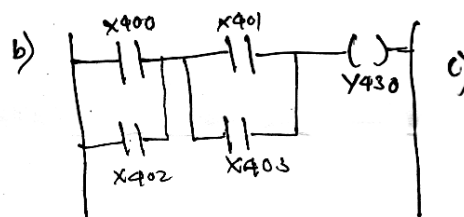
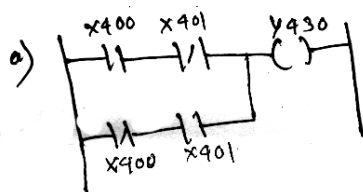
- 1 a. What is PLC? List its features? Explain its advantages and disadvantages. 7
- b. Explain in detail input and output unit of PLC. 7
- c. Explain proximity sensor. 6
- 2 a. With block diagram, explain fundamental components of PLC. 8
- b. Explain the terms associated to measure performance of sensors. 8
- c. Classify and state common types of PLC based on mechanical design. 4

**UNIT - II**

- 3 a. Explain the working of ADC and DAC. 8
- b. Classify and explain various networking configurations. 6
- c. What are protocols? Illustrate commonly used communication protocols. 6
- 4 a. Explain ISO/OSI network model. 10
- b. Differentiate serial and parallel communication? Explain serial standards. 10

**UNIT - III**

- 5 a. Write the ladder diagram, timing diagram, functional block diagram for NAND and NOR logic gates. 8
- b. Draw the ladder diagram and FBD for,
  - i) Either of two, normally open, switches have to be closed for a coil to be energized and operate an actuator. 6
  - ii) A light is to come on if there is no input to a sensor.
  - iii) A solenoid valve is to be activated of sensor A gives an input.
- c. Write the instruction list for the following LADDER diagram. 6



- 6 a. Write a ladder diagram and timing diagram for,
  - i) Ladder rung with one input and two outputs. 6
  - ii) Three inputs and three output with sequenced control.
  - iii) XOR logic gate.
- b. Explain the importance of, location of stop and emergency switches in PLC system. 7
- c. Write structured text program for the following,
  - i) A tank is filled by opening valve 1, as long as level switch 1 is not triggered and the drain valve is closed. 7
  - ii) To set the temperature of an enclosure by switches to the valve 40, 50, 60 and 70 and switch on fan 1 when the temperature is 60 and fan 2 when it is 70.

**UNIT - IV**

- 7 a. With ladder diagram, explain sequencing and cascading application of on – delay timer. 6
- b. Write and explain ladder program for traffic light sequence using timer. 8
- c. What are counter? Illustrate terms of counters. 6
- 8 a. Classify and explain different types of timer. 6
- b. With diagram, explain drum sequences. 7
- c. Explain with an example, how shift registers are programmed in ladder diagram. 7

**UNIT - V**

- 9 a. Explain the role of SCADA in automation of industry. 10
- b. Explain data handling instructions of PLC. 10
- 10 a. What is SCADA? Explain Architecture of SCADA. 10
- b. Explain the features and applications of SCADA in detail. 10

\* \* \* \*