

Total No. of Questions : 8]

SEAT No. :

PE-2216

[Total No. of Pages : 2

[6584]-116

B.E. (Electrical Engineering)

PLC & SCADA

(2019 Pattern) (Semester - VII) (403143(A)) (Elective - III)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume suitable additional data, if necessary.
- 5) Use of non-programmable calculator is allowed.

- Q1) a) Explain rule for proper construction of PLC ladder diagram? [4]
b) Explain ON delay timer in details along with its timing diagram? [6]
c) Draw the ladder diagram for following function table Input I1, I2 output Q1, Q2, Q3, Q4? [8]

I1	I2	Q1	Q2	Q3	Q4
0	0	1	1	0	0
0	1	0	1	1	0
1	0	0	1	1	0
1	1	1	0	0	1

OR

- Q2) a) Explain Master Control Relay (MCR) Instruction with diagram? [4]
b) Explain UP counters in details along with its ladder diagram? [6]
c) Three motor are controlled using three separate timers. Each motor will remain ON for 10 second. After every 10 second previous motor stop and next motor become ON. This will be continuing in a cycle. Switch I1 is used for start and I2 is used for stop the cycle. Following table explain the function. Input I1, I2 output M1, M2 and M3 [8]

I1=1 and I2=0	Timer	Time	M1	M2	M3
----	T1	10 sec	1	0	0
----	T2	10 sec	0	1	0
---	T3	10 sec	0	0	1
I1=0 and I2=1	----	----	0	0	0

P.T.O.

- Q3)** a) Explain Short note on PID Controller. [3]
b) Explain the effect of changes in K_p , K_i and K_d on the performance of the system? [6]
c) Explain speed control of DC motor with DC source with suitable diagram? [8]

OR

- Q4)** a) Explain Overload protection for AC motor? [3]
b) Explain any two method of PID tuning? [6]
c) Explain speed control of DC motor with AC source with suitable diagram? [8]

- Q5)** a) Explain the various communication technologies used in SCADA system? [4]
b) Draw and explain SCADA architecture in details? [6]
c) State and explain advantages and disadvantages SCADA System? [8]

OR

- Q6)** a) State the desirable properties of SCADA system? [4]
b) Explain three generation of SCADA Architecture? [6]
c) Draw and explain SCADA in automatic substation control? [8]

- Q7)** a) What is protocol and state different types of SCADA protocol? [3]
b) Draw and explain OSI model and their function? [6]
c) Draw and explain DNP3 protocol? [8]

OR

- Q8)** a) State advantages and Application DCS System? [3]
b) Draw and explain CIP protocol and their Function? [6]
c) Draw and explain IEC 16850 layered architecture? [8]

