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B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019

Seventh Semester

EE16704 – INDUSTRIAL AUTOMATION AND NETWORKING*(Electrical and Electronics Engineering)***(Regulation 2016)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

PART A - (10 X 2 = 20 Marks)

	CO	RBT
1. Define industrial automation? Write the advantages.	1	R
2. What is smart sensor? Mention some applications.	1	R
3. Distinguish between single acting and double acting cylinder?	2	U
4. What are the different between pneumatic and hydraulic systems?	2	U
5. List out the programming languages in PLC.	3	U
6. Write a program that will turn a light on when a count reaches 20. The light is then to go off when a count of 30 is reached.	3	U
7. What is SCADA?	4	R
8. Give some applications of DCS.	4	U
9. What are the advantages of Serial communication?	5	U
10. Write the three Asimov laws of Robot?	5	R

PART B - (5 X16 = 80 Marks)

11. (a) (i) Explain the architecture of Industrial Automation systems with the help of Automation pyramid. (10) 1 U
- (ii) What are the different types of automation system? Explain in details. (6) 1 U

(OR)

- (b) (i) Explain the sensors and measurements systems for the following physical quantities (a) displacement (b) temperature (c) level (10) 1 U
- (ii) Discuss about various types of errors in measurements system. (6) 1 U

12. (a) Consider an automatic drilling machine. The complete cycle is as follows: Cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts, Cylinder A then retracts to unclamp the work piece. Design a control circuit applying the K-V mapping method. The circuit is provided with a start valve to avoid continuous cycling. **(16) 2 AN**

(OR)

- (b) Describe in detail about all types of pneumatic Actuators. **(16) 2 U**
13. (a) (i) Explain the principle of operation of discrete I/O modules used in PLC with suitable diagrams. **(8) 3 U**
- (ii) Depict the function of various types of timers with necessary wave forms. **(8) 3 U**

(OR)

- (b) (i) Develop a ladder logic in Programmable logic controller for forward and reverse speed control of an Induction motor. **(8) 3 AP**
- (ii) Develop a ladder logic in Programmable logic controller for Traffic Light Control in two direction. **(8) 3 AP**
14. (a) (i) Draw and explain basic SCADA system architecture. **(8) 4 U**
- (ii) Draw and explain the architecture of distributed control system. **(8) 4 U**

(OR)

- (b) Describe about How position and velocity of the CNC machine tool axes must be controlled in PTP and Contouring systems? **(16) 4 U**
15. (a) Discuss in detail about Profibus. **(16) 5 U**

(OR)

- (b) (i) With neat sketch explain about various communication topologies used in Process industries. **(10) 5 U**
- (ii) Draw and explain the types of joints used in robots. **(6) 5 U**