

FACULTY OF ENGINEERING & TECHNOLOGY

B.E (/EEE/EE/EEP) Examination - DEC - 2014

Industrial Automation (Revised)

[Time: Three Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

- N.B**
- 1) Q.No.1 & Q.No.6 are compulsory
 - 2) Solve any two questions from remaining questions in section A & B.
 - 3) Figures to the right indicate full marks.

SECTION A

- Q.1 Solve any five 10
- i) Define industrial automation. What are the advantages?
 - ii) What is the role of actuator? How are they categorized?
 - iii) What are the low energy output signals of controllers used in electrical & pneumatic system? Write their range.
 - iv) What is mean by discrete & continuous variable? Give the example.
 - v) List the four input & output devices connected to programmable logic controller.
 - vi) Draw ladder diagram for a) ON/Off operation b) Both direction of Dc motor controlled by switches.
 - vii) List the four main control system technologies used for industrial automation.
 - viii) What are the advanced PLC functions?
- Q.2 A) What are the types of operations in industries? How automation is achieved for them? Draw & explain basic automated system. 08
- B) How a supervisory or digital control is applied to control temperature in any heat treatment process? Draw & explain its control system. 07
- Q.3 A) How level of automation is described as manually operated, semi-automatic & fully automatic? Explain. 08
- B) Why digital control, supervisory control is required? How it is achieved? What are their features, merits & de-merits? 07
- Q.4 A) Draw & explain functional programmable logic controller. 08
- B) Draw & explain modbus protocol. 07
- Q.5 A) How serial communication standards used with PLC? Draw their transmission diagrams & explain. 08
- B) How a liquid level in a tank is controlled by continuous control & discrete control? Explain if they applied separately & compositely. 07

SECTION B

Q.6	Solve any five	10
	i) What are the functions of SCADA?	
	ii) What are the alarm functions arranged through SCADA system in substation control?	
	iii) Define DCS. Write its advantages.	
	iv) How displays are categorized in DCS?	
	v) What are the main types of interfaces used in SCADA?	
	vi) List the applications of DCS.	
	vii) What is the standard communication protocols used in SCADA?	
	viii) List the data variables acquired from different substation using SCADA system.	
Q.7	A) What factor makes SCADA different from other control & monitoring system? What is its architecture? Explain.	08
	B) How analog & discrete control is obtained using remote terminal unit (RTU) in the field? Explain.	07
Q.8	A) How SCADA is implemented for power system operation? Explain basic elements.	08
	B) List the various types of user interfaces in SCADA. Explain each.	07
Q.9	A) Draw & explain basic DCS architecture.	08
	B) How multiplexing & remote sensing is achieved in DCS? Explain.	07
Q.10	Write short note on any three	15
	i) Automatic substation control	
	ii) Data logger & Report generation	
	iii) Various ways of communications technologies	
	iv) Difference between DCS & traditional control system.	