

Total number of printed pages = 3

19/6th Sem/DIE 611

2022

## INDUSTRIAL AUTOMATION

Full Marks – 100

Time – Three hours

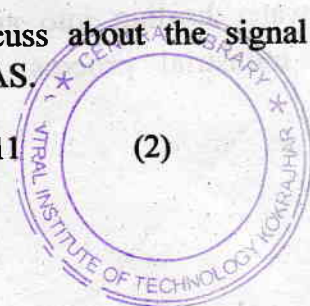
The figures in the margin indicate full marks  
for the questions.

Answer any *five* questions.

1. (a) What is meant by automation? Why automation is required for the industrial processes? 2+3=5
- (b) What is automated process management system? Describe with proper flow chart and block diagram. 2+8=10
- (c) Describe the steps that convert a process of water heating into an automated working industrial process. 5

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2. (a) Define localized process and distributed process with suitable example. 3+3=6
- (b) What is Distributed Control System (DCS)? Discuss DCS architecture with proper block diagram and example. 10
- (c) Discuss SAMA diagrams as a part of the industrial documentation of processes. 4
3. (a) Briefly explain the hierarchical concept of automation in industry. 5
- (b) What are the components of process control? Discuss with respect to a physical process control loop of a flow control system. 10
- (c) Write the objectives of Data Acquisition System (DAS). 5
4. (a) What is SCADA system? Write four components of SCADA. Discuss about SCADA architecture. 2+4+4=10
- (b) Discuss about the type of Robot and Robot application. 6
- (c) Briefly discuss about the signal conditioning in DAS. 4



5. (a) Draw electromechanical relay with two connectors. 5
- (b) Draw and derive the expression of negative feedback. What are the advantages of negative feedback? 5
- (c) Draw AND circuit, draw its relay circuit. Also draw its LADDER logic diagram. Finally draw PLC circuit. 10
6. (a) What is latch? Explain with diagram. 5
- (b) Write a note on PID controller. 5
- (c) Explain with diagram of PLC counter with example. 5
- (d) Write five PLC instructions. 5
7. (a) What is HART protocol? Explain. 5
- (b) Write a note on RS232 interface standard. 5
- (c) Write a note on industrial network security. 5
- (d) What is field bus? 5

