

15-12-2016



Q.P. Code : 812202

(3 Hours)

[Total Marks: 80]

- N.B: (1) Question No. 1 is compulsory.
(2) Attempt any **Three** questions from remaining.
(3) **Figures** to the **right** indicate **full marks**.

1. Answer the following:-

[20]

- Explain continuous, discrete and mixed processes with examples.
- Explain the functions of PLC I/O module.
- Why HMI assumes a special significance in SCADA.
- Write a note on DCS flow sheet symbols.

2. (a) Explain the PLC ladder diagram instructions -

[10]

ON Timer, OFF Timer and Retentive timer.

(b) Write a ladder program for a bottle filling application for the given sequence-

[10]

- When the START button is pressed the conveyor belt motor should be ON till a bottle is sensed.
- The BOTTLE FULL switch senses if the bottle is empty and opens the valve V1.
- The MOTOR starts again till next bottle is sensed.

Inputs:-

BOTTLE PRESENT switch- (NO)

BOTTLE FULL switch- (NO)

START Push button -(NO)

STOP button - (NC)

Outputs :- VALVE V1, MOTOR

Draw I/O wiring diagrams, show memory calculations and ladder diagram.

3. (a) Explain the need for DCS integration with PLC and computer.

Also explain the methods of integration.

[10]

(b) With a neat sketch explain how RTU communicates with the field and MTU in SCADA.

[10]

TURN OVER



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4. (a) Explain how SIS is developed using safety life cycle approach. [10]
(b) Explain ISA - S95 in connection with MES and ERP integration. [05]
(c) What is the need for alarm management system? [05]
5. (a) Compare PLC, DCS and SCADA on the basis of [10]
i) Controllers ii) Processing capabilities iii) Data base
iv) HMI/GUI v) applications
(b) Explain with a neat diagram, evolution of DCS. [10]
6. Write Short note on: - [20]
(a) Scan interval of SCADA system.
(b) Special purpose modules with respect to PLC.
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