

17663

15116

3 Hours / 100 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. a) Attempt any THREE of the following:** **12**
- (i) Draw P and ID symbol for
 - 1) Control Panel mounted level transmitter
 - 2) Orifice plate
 - 3) PLC function
 - 4) Pneumatic single line
 - (ii) State any four applications of ratio control.
 - (iii) Draw the architecture of DCS. Explain the function of any two blocks.
 - (iv) Draw feedback control scheme for any one type of dryer.

P.T.O.

- b) Attempt any ONE of the following:** **06**
- (i) Draw P and I diagram for boiler instrumentation and prepare instrument index sheet of it.
 - (ii) Differentiate between batch and continuous process.
(any six points)
- 2. Attempt any TWO of the following:** **16**
- a) Define Valve Positioner. Draw the diagram of electro-pneumatic valve positioner and explain its working.
 - b) Draw feedback control scheme for two effect evaporator and explain it.
 - c) (i) List and draw any four types of DCS displays.
(ii) Draw the block diagram of DCS used in cement industry. Explain it.
- 3. Attempt any FOUR of the following:** **16**
- a) Draw feedforward scheme of heat exchange and explain it.
 - b) State the functions of any four parts of control valve.
 - c) Describe selective control scheme with example.
 - d) Describe any four methods of minimizing cavitation.
 - e) List four communication methods in DCS. Differentiate between Modbus and Profibus.
- 4. a) Attempt any THREE of the following:** **12**
- (i) List four advantages of automatic control over human aided control.
 - (ii) Explain the flow characteristics of control valve.
 - (iii) 1) Draw schematic diagram of water tube boiler.
2) Draw the diagram of 3 element boiler drum level control.
 - (iv) List any four documents prepared by Instrumentation engineer in basic engineering. State the purpose of each.

b) Attempt any ONE of the following:**06**

- (i) Draw the diagram of solenoid valve and explain. State its use.
- (ii) Draw the block diagram of DCS in Thermal Power Industry and explain.

5. Attempt any TWO of the following:**16**

- a) Differentiate between feedback and feedforward control. (Four points)
- b) What is flushing? How it can be avoided? Describe the role of Instrumentation engineer in project engineering.
- c) (i) State four advantages of DCS system.
(ii) State selection criteria of DCS system.

6. Attempt any FOUR of the following:**16**

- a) Explain graphic and alarm displays of DCS.
 - b) State one advantage and one disadvantage each of ball valve, globe valve, butterfly valve and solenoid valve.
 - c) Describe the operation of distillation column with the help of diagram.
 - d) Draw the diagram of process control system and explain it.
 - e) List the features of typical DCS (Eight points).
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