

17663

15162

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 :

4 × 3 = 12

- (a) Draw block diagram of adaptive control system and describe its working.
- (b) Draw feed forward control scheme for drum level of boiler and write its working in brief.
- (c) Draw the neat labelled diagram of (i) Ball valve & (ii) Globe valve.
- (d) Draw P & ID symbol for (i) Orificemeter, (ii) Venturimeter, (iii) Temperature transmitter, (iv) Rotameter.

(B) Attempt any ONE :

6

- (a) Enlist types of drying process. Describe any one drying process with neat diagram.
- (b) Draw the P & I diagram for boiler instrumentation & describe the operation.

2. Attempt any TWO :**2 × 8 = 16**

- (a) Draw the block diagram of DCS in cement industry and describe its working.
- (b) Describe the working of distillation column with neat diagram. Draw cascade control scheme for any two variable in distillation column.
- (c) State the necessity of valve positioner. Draw the neat diagram of electropneumatic valve positioner. Write its working.

3. Attempt any FOUR :**4 × 4 = 16**

- (a) Discriminate human aided and automatic process control.
- (b) Differentiate between Heat exchanger process and evaporation process.
- (c) Draw control valve flow characteristics. Give meaning of any one.
- (d) Compare feedback and feed forward control system. (Any four points)
- (e) Name the different DCS communication methods. Describe any one.

4. (A) Attempt any THREE :**3 × 4 = 12**

- (a) Describe working of solenoid control valve with neat diagram.
- (b) Write purpose of instrument index sheet and process flow sheet.
- (c) State the advantages of DCS system (any four).
- (d) Draw the neat diagram of butterfly valve and describe its working.

(B) Attempt any ONE :**6**

- (a) Describe different remedies to avoid problem of cavitation and flushing in control valve.
- (b) Draw the block diagram of batch process and continuous process. Describe processes with examples.

5. Attempt any TWO :**2 × 8 = 16**

- (a) Describe the working of ratio control system with example.
- (b) Enlist the documents required for instrumentation in project engineering. State role of instrumentation engineer in project engineering.
- (c) Draw the block diagram of DCS in thermal power industry and describe its working.

6. Attempt any FOUR :**4 × 4 = 16**

- (a) Draw the diagram of temperature control system and state the functions of each element.
 - (b) Find the proper valve size in inches and centimeter for pumping the liquid flow rate of 600 gal/min with maximum pressure difference of 55 psi. Liquid specific gravity is 1.3. Find valve size.
 - (c) List the features of typical DCS (eight points).
 - (d) Draw the block diagram of selective control with example. Describe its working.
 - (e) Explain the principle of control valve in brief. State criteria of control valve selection and sizing.
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