22542

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

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. Attempt any FIVE of the following : **10**

(a) State 2 benefits of process instrumentation.

(b) State the need of signal transmission. List the 2 types of it.

(c) Define Data Acquisition System.

(d) List 2 types of control panel.

(e) State the hazardous area protection methods used for

(i) Transformers

(ii) Relays

(f) Define :

(i) Process load

(ii) Process lag

(g) Draw fire triangle. List two hazardous area protection methods.

2. Attempt any THREE of the following : **12**

(a) Describe any two process dynamics.

(b) Draw the diagram of flapper-nozzle system. Explain its working. Draw the characteristics of the system.

(c) Draw the block diagram of data logger and explain.

(d) List any 4 documents required for designing control panel. Describe any one.

3. Attempt any THREE of the following : **12**

(a) Draw the block diagram of smart transmitter. Describe any 3 features of it.

(b) Draw the diagram of I/P converter. Explain its working.

(c) State any 4 ergonomic considerations for control panels.

(d) Explain the meaning of

(i) IP 23

(ii) IP 45

4. Attempt any THREE of the following : **12**

(a) Draw the diagram of level control system. State (i) Manipulated variable and (ii) Controlled variable in it.

(b) Draw the diagram of electronic temperature transmitter. Explain its working.

(c) Draw the diagram of Pneumatic DP transmitter. Explain its working.

(d) Draw the schematic diagram of Alarm Annunciator. Explain its sequence of operation.

(e) Describe hazardous area classification as per NEC & IEC.

5. Attempt any TWO of the following : **12**

(a) Explain the calibration procedure of DP transmitter (Pneumatic or Electronic).

(b) Draw the diagram of multichannel DAS. Explain its working. State any 2 applications of it.

(c) Define Intrinsic safety. Draw and explain working of zener barrier circuit.

6. Attempt any TWO of the following : **12**

(a) Draw the installation diagram of temperature transmitter (pneumatic or electronic) and explain it.

(b) Draw the diagram of X-Y recorder. Explain its working. State any 2 applications of it.

(c) Draw the layout of typical control room. Describe any four ergonomic considerations of it.
