17540

16117

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****.*
(2) Illustrate your answers with neat sketches ***wherever*** *necessary.*
(3) Figures to the ***right*** *indicate* ***full*** *marks.*
(4) Assume suitable data, if ***necessary****.*
(5) Use of Non-programmable Electronic Pocket Calculator is ***permissible****.*
(6) Mobile Phone, Pager and any other Electronic Communication devices are ***not*** *permissible in Examination Hall.*

Marks

1. A) Attempt **any three** : **12**

a) List four different types of process characteristics. Describe any one in brief.

b) State the differences between strip chart and X – Y recorder (any four points).

c) Write the standard ranges of electronic and pneumatic signal transmission. Describe live zero in brief.

d) Draw and explain current to voltage converter.

B) Attempt **any one** : **6**

a) Draw and explain pressure to current converter.

b) Draw the block diagram of data logger and explain its working.

2. Attempt **any two** : **16**

a) Draw a neat diagram of force balance type electronic DP transmitter. Explain its working.

b) Draw schematic diagram of alarm annunciator. Describe its standard operational sequences.

c) Draw a general layout of control room. Discuss any six ergonomic considerations of it.

3. Attempt **any four** : **16**

a) Draw a labelled block diagram of process control system. Define the terms
1) Manipulated variable 2) Controlled variable

b) State the need of control panel. Draw the layout of any one type of control panel.

c) Draw the block diagram of single channel data acquisition system. Explain each block in brief.

d) Draw the diagram of XY recorder and label the parts.

e) List the protection methods of Hazardous area. Explain the explosion proofing method in brief.

P.T.O.

Marks

4. A) Attempt **any 3** : **12**

a) State the need of converters. Draw and explain I to P convertor.

b) Draw and explain flapper nozzle assembly.

c) Explain the meaning of following IP codes

i) IP 65 ii) IP 34

iii) IP 22 iv) IP X3

d) Classify the following materials into appropriate hazardous areas :

1) Hydrogen 2) Aluminium dust

3) Wheat 4) Coal

B) Attempt **any 1:** **6**

a) Describe "HART" communication protocol with relevant diagrams.

b) State the application of DAS (any two). Draw the block diagram of multichannel DAS and label the parts. Explain in brief.

5. Answer **any 2** : **16**

a) Give the classification of hazardous area location in detail.

b) Draw the block diagram of SMART transmitter and explain its working.

c) State the meaning of the code IP. Explain IP classification in detail.

6. Answer **any 4** : **16**

a) Explain the following terms w.r. to DAS :

i) Ratiometric conversion ii) Logarithmic conversion

b) Define intrinsic safety. Draw and explain zener barrier circuit to achieve Intrinsic safety.

c) Define calibration. Draw any one method to calibrate a pressure gauge. Label the parts.

d) List different types of process dynamics. Explain any one.

e) State the benefits of process Instrumentation (any 4).