



- N.B. :** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume suitable data whenever required.

1. (a) Compare an electrical, pneumatic and hydraulic systems. 10
 (b) Explain the necessity of control valve positioner and explain how it works. 10

2. (a) Explain the inherent and installed flow characteristics of control valves. 10
 Also define :-
 (i) Rangeability
 (ii) Turn down and
 (iii) Control valve flow coefficient.
 (b) Draw and explain following control valves :- 10
 (i) Butterfly valve
 (ii) Solenoid valve.

3. (a) Draw and explain the reciprocating piston type compressor. Also compare 10
 it with rotary compressor.
 (b) Draw and explain the construction and working of I to P converter. 10

4. (a) Draw and explain the flapper nozzle system. Also explain in brief its important 10
 process control applications.
 (b) Explain the various speed control methods of hydraulic motors. 10

5. (a) Draw and explain the operation of DP transmitter. Explain how it is installed 10
 to measure liquid level in open vessel tank and closed vessel tank.
 (b) What is smart transmitter? Explain in detail its salient features. 10

6. (a) What are the different methods of air pressure regulation in pneumatic 10
 systems? Explain any one method in detail.
 (b) Draw and explain the basic annunciator system. What are the different 10
 types of annunciators?

7. Write short notes on :- 20
 (a) Selection criterion of control valve
 (b) Square root extractor
 (c) Dumpers
 (d) Ball valves.
