

## PROCESS CONTROL AND INSTRUMENTATION

03.05.2016

Answer SIX questions including Q No. 1 which is compulsory.

The figures in the right hand margin indicate marks. Symbols carry usual meaning.

Full marks: 70

Time: 3 hours

1. Answer the following questions :

2 x 10

- (a) List any four objectives of process control.
- (b) What are the different types of variables in a process?
- (c) Draw the process symbol for distillation column.
- (d) What is meant by on/off control action?
- (e) Why derivative mode of control is not recommended for a noisy process?
- (f) Write the applications of programmable logic controllers.
- (g) What is meant by field bus?
- (h) Write the applications of electronic controllers.
- (i) What is meant by multivariable control?
- (j) Give the examples of PLC based control processes.

2. What is the use of distillation column in process industries? Explain briefly the various control methods used in distillation column 10

3. Write in brief about the basic control actions used in industrial process controllers. 10

4. Give a schematic representation for a pneumatic controller. Discuss the function of each component. Also enlists its merits, demerits and its typical applications. 10

5. Construct a block diagram of room heating system and also state the functions of each block in the constructed system. 10

6. Draw the block diagram of PLC. Describe each block. 10

7. Write a short notes on the following 5+5  
(a) Heat exchanger (b) smart sensors

8. Explain briefly about computer control of liquid level system with suitable diagram. 10