



C09-AEI-406

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BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2016
DAEIE—FOURTH SEMESTER EXAMINATION
PROCESS CONTROL

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define controlled variable and manipulated variable.
2. Classify the controller modes.
3. Define proportion band and offset.
4. State the need for electric to pressure converter.
5. Draw the diagram of solenoid valve.
6. Distinguish between feedback and feedforward controls.
7. Define adaptive controller.
8. List the applications of ratio control system.

- * 9. Define P & I diagram.
10. Draw the symbols of the following :
- (a) Controller
 - (b) Transmitter

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Draw the block diagram of process control loop. Explain each element in process control loop. 4+6
12. State the need for tuning of PID controllers. Describe the process reactance curve method of tuning of PID controller. 3+7
13. Define the following control system parameters : 2×5=10
- (a) Error
 - (b) Controller output
 - (c) Control lag
 - (d) Dead time
 - (e) Cycling
14. Explain the implementation of proportional controller and integral controller modes using op-amp. 5+5
15. Explain the pneumatic and hydraulic actuators with neat diagrams. 5+5
- * 16. Explain the following types of control valves : 10
- (a) Linear
 - (b) Quick opening
 - (c) Equal percentage

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17. Explain the block diagram of cascade controller.

18. (a) Draw the line diagrams of the following : 5

- (i) Electric line
- (ii) Pneumatic line
- (iii) Hydraulic line
- (iv) Capillary line
- (v) Process line

(b) Explain the ANSI standard used in instrumentation. 5
