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C-20-AEI–404

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BOARD DIPLOMA EXAMINATION, (C-20)

JUNE/JULY—2022

DAEI - 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 the term process control.

2. Define controlled variable.

3. Define the term process lag.

4. List any three discontinuous control modes.

5. Draw the flow lift characteristics of quick opening linear and equal percentage control valves.

6. Write the principle of electric to pressure converter.

7. Define compound variable control system.

8. Define adaptive control system.

9. Draw the symbols for the following control valves :

(i) Globe valve

(ii) Gate valve

(iii) Solenoid valve

10. Draw the line diagrams and symbols :

(i) Point of measurement

(ii) Orifice installed line

(iii) Internal system link

PART—B

8×5=40

Instructions : (1) Answer *all* questions.

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

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

11. *(a)* Explain each element in process control loop with diagram.

(OR)

(b) Explain the batch process with example.

12. *(a)* *(i)* Explain the PI control mode with diagram.

(ii) List the characteristics of PI control mode.

(OR)

(b) *(i)* Explain the PD control mode with diagram.

(ii) List the advantages and disadvantages of PD control mode.

13. *(a)* Explain the principle of operation of hydraulic actuator with diagram.

(OR)

(b) Explain the principle of operation of pneumatic actuator with diagram.

14. *(a)* Explain feed forward control system with block diagram.

(OR)

(b) Explain cascade control system with block diagram.

15. *(a)* Explain the use of letter codes for identification of instruments.

(OR)

(b) Explain ISA and DIN standards used in instrumentation.

PART—C

1×10=10

Instructions : (1) Answer the following question.

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

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

16. A hydraulic actuator requires a force of 10 kN to move a work-piece. What is the needed working pressure, if the diameter is 100 mm? Explain the principle of operation with diagram.

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