



C14-EE-606

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BOARD DIPLOMA EXAMINATION, (C-14)  
OCT/NOV—2017  
DEEE—SIXTH SEMESTER EXAMINATION  
INDUSTRIAL AUTOMATION

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. Explain the necessity of automation.
2. Give an example of a closed-loop system and explain briefly.
3. List different input devices used in control system.
4. State the applications of potentiometers.
5. What is the concept of tachogenerator?
6. State the limitations of transfer function.
7. Write the Laplace transforms of resistance ( $R$ ), inductance ( $L$ ) and capacitance ( $C$ ).

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8. Define linear and non-linear control systems.
9. Draw the ladder diagram for NAND gate.
10. List the advantages of PLC.

**PART—B**

10×5=50

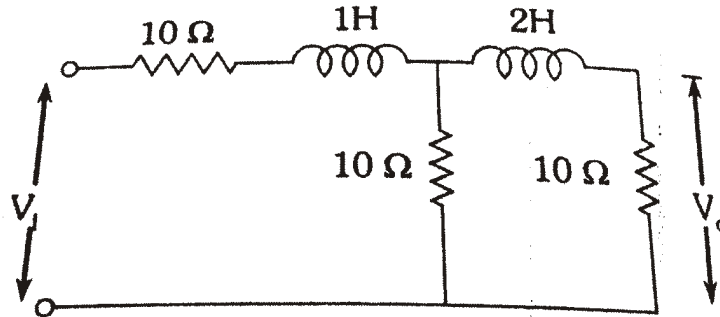
**Instructions** : (1) Answer *any five* questions.

(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. (a) State the advantages and disadvantages of feedback control systems. 5
- (b) Define transfer function and derive it for closed-loop feedback control system. 5
12. (a) Write the force balance equations of mechanical elements and their analogous electrical elements in force voltage analogy. 5
- (b) Explain PI-controller with block diagram. 5
13. (a) Explain the working of electromagnetic relay with a neat sketch. 5
- (b) Explain the working of reed relay. 5
14. Explain the working of potentiometers and their use as error detectors. 10
15. (a) State the differences between hydraulic and pneumatic controllers. 5
- (b) Explain the working principle of AC servomotor. 5

16. Derive the <sup>\*</sup> transfer function for the following electrical network : 10



17. (a) State the applications of PLC. 5  
(b) Draw the block diagram of PLC. 5
18. (a) Explain on delay and off delay timer instructions. 5  
(b) Draw the ladder diagram of DOL starter. 5

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