



C09-AEI-404

**3414**

**BOARD DIPLOMA EXAMINATION, (C-09)  
OCT/NOV—2015  
DAEIE—FOURTH SEMESTER EXAMINATION**

INDUSTRIAL ELECTRONICS AND CONTROL ENGINEERING

Time : 3 hours ]

[ Total Marks : 80

---

**PART—A**

3×10=30

**Instructions** : (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State the working of opto couplers.
2. List any three applications of photomultipliers.
3. Draw the circuit of HF power source for induction heating.
4. List any three applications of dielectric heating.
5. State piezoelectric effect.
6. State the need of a feedback in control system.
7. State the rule for 'moving a summing point beyond a gain block' in a block diagram reduction.
8. State the properties of transfer function of a system.

\* 9. Define the following transient response specifications :

(a) Rise time

(b) Steady-state error.

10. Define velocity error constant  $K_v$ .

**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. Explain the construction and working of photoconductive cell with a diagram.

12. Draw the circuit of AC resistance welding and explain its working.

13. Draw the circuit of magnetostriction oscillator and explain its working.

14. Explain about the following : 5+5

(a) Time invariant control systems

(b) Non-linear control systems

\* 15. (a) Find the inverse Laplace transform of the following function : 5

$$F(s) = \frac{1}{(s+1)(s+2)}$$

(b) Derive the transfer function of RLC series circuit. 5

- \* **16.** (a) Derive the Laplace transform of  $\cos at$ . 5
- (b) Resolve the following function into partial fractions : 5
- $$F(s) = \frac{12}{(s-2)(s^2-3s-5)}$$
- 17.** (a) Derive the expression for unit ramp response of a first-order system. 6
- (b) Derive the expression for impulse response of a first-order system. 4
- 18.** (a) Explain about seven segment displays. 5
- (b) State any three advantages of induction heating. 3
- (c) List any two appliances of induction heating. 2

\*\*\*