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C14–AEI–406

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## BOARD DIPLOMA EXAMINATION, (C–14)

## MARCH/APRIL—2018

## DAEIE—FOURTH SEMESTER EXAMINATION

INDUSTRIAL ELECTRONICS AND CONTROL SYSTEMS

*Time* : 3 hours] [*Total Marks* : 80

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**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.** Mention the types of discrete displays.

**2.** Draw the photomultiplier tube.

**3.** List the types of resistance welding.

**4.** List the applications of induction heating.

**5.** Define control system.

**6.** Write the properties of transfer function of a system.

**7.** Find the partial fractions of the function $F(s) = \frac{1}{s^2+7s+10}$.

**8.** Define inverse Laplace transform.

**9.** Define relative stability of a control system.

**10.** Define peak time.

## 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)* Explain the constructional details and working of optocoupler. 5

*(b)* Explain about seven-segment display. 5

**12.** Explain the methods of coupling electrodes with RF generator.

**13.** Explain the working of high frequency power source for induction heating with circuit diagram.

**14.** *(a)* Write any three differences between open-loop and closed-loop control systems. 3

*(b)* Explain open-loop control system with an example. 7

**15.** Find the Laplace transform of impulse signal.

**16.** Derive the transfer function of RLC parallel circuit.

**17.** *(a)* State Manson's gain formula.

*(b)* A unity feedback control system has an open-loop transfer function $G(s)=\frac{10}{(s+1)(s+2)}$. Find static error constants of the system.

**18.** Using Routh-Hurwitz stability criterion, determine the stability of the system represented by the characteristic equation $s^4+8s^3+18s^2+16s+5=0$. Comment on the location of the roots of the characteristic equation.

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