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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ANE) (Sem.-6)
AUTOMATIC FLIGHT CONTROL
Subject Code : ANE-321
M.Code : 60530

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

(10 × 2)

- a) Transfer function
- b) Compensation
- c) Open loop control system
- d) Stability derivatives
- e) Bode plot
- f) Significance of signal flow graphs
- g) Classical control theory
- h) Steady state error
- i) Gain margin
- j) Multivariable system

SECTION-B

2. Write a note on 'Forward path Compensation'. 5
3. Sketch a root locus plot for a typical control system while explaining the rules for graphical construction of root locus plot. 5
4. Define and differentiate between 'Displacement Autopilot' and 'Pitch Displacement Autopilot'. 5
5. Write a note on 'Instrument Landing System'. 5
6. Write a note on 'Routh-Huritz criterion'. 5

SECTION-C

7. Given the following transfer function, determine the steady-state error of the system to unit step, ramp and parabolic input : 10

$$G(s)H(s) = \frac{k(s+2)}{s(s+1)(s+4)(s+5)}$$

8. Determine whether the characteristic equations given below has stable or unstable roots. (2 × 5)
 - a) $2\lambda^3 + 4\lambda^2 + 4\lambda + 12 = 0$
 - b) $\lambda^3 + 6\lambda^2 + 12\lambda + 8 = 0$
9. Explain the following controllers with the help of examples : (2, 2, 3, 3.)
 - a) Proportional Controller
 - b) Integral Controller
 - c) PI Controller
 - d) PID Controller

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.