Reg. No. : | | | | | | | | | | | | |

Question Paper Code: 1105338

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Fifth Semester
Aerospace Engineering
U20AS504 – FUNDAMENTALS OF AEROSPACE CONTROL ENGINEERING
(Regulation 2020)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. What are the advantages of negative feedback system?

2. Compare open loop and closed loop system.

3. What is a characteristic equation?

4. What are the main significances of root locus?

5. What is frequency response?

6. Define gain margin?

7. What is a steady state error?

8. What are the three constants associated with a steady state error?

9. Mention the characteristics of any two spacecraft coordinate systems.

10. What are the different types of spacecraft attitude sensors?

PART – B (5 x 16 = 80 Marks)

11. (a) (i) Explain the requirements of an ideal control system. (8)
(ii) Explain the characteristics of standard test signals with diagram. (a) Step (b) Ramp (c) Parabolic. (8)

(OR)

(b) Derive the response of undamped second order system for unit step input. (16)

12. (a) Mention all the rules to sketch the root locus in detail. (16)

(OR)

(b) Sketch the Root Locus for the given system in the graph sheet. (16)

$$G(s)\,H(s) = \frac{k}{s\left(s^2 + 2s + 2\right)}$$

13. (a) Define phase margin, gain margin, gain crossover and phase crossover frequencies with necessary equations. (16)

(OR)

(b) State all the rules to Sketch the Polar plots in detail. (16)

14. (a) Explain in detail the types of compensation with necessary block diagram. (16)

(OR)

(b) Explain the Digital PID controller in detail. (16)

15. (a) Derive the condition for torque free motion in spacecraft attitude determination. (16)

(OR)

(b) Explain the functions of spacecraft attitude Actuators and controllers. (16)

----------xxxx----------