

End Semester Examinations - 2015-16 Even Semester - May 2016

14AE2027 Navigation, Guidance and Control of Aerospace Vehicles

Set A

Time : 3 hrs
Total Marks: 100

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1. i. What are the different segments of GPS? Explain. (10)
- ii. How are the clocks in different segment synchronized? How is the position of a receiver computed? Explain triangulation/trilateration with a sketch. (10)
- OR**
2. Write short notes in the following. (20)
- i. TACAN
- ii. LORAN – C
- iii. VOR
- iv. DME
3. Explain the first approach guidance systems developed in 1966 in California. (20)
- OR**
4. Explain the most flexible approach guidance system that was highly advantageous over ILS, but failed to become popular because of development of GPS. (20)
5. Give a detailed note on different types of gyroscopes. (20)
- OR**
6. Using the row of zeros and first element zero methods, solve the following. (20)
- i. The characteristic polynomial of a system of a system is $s^7 + 9s^6 + 24s^5 + 24s^4 + 24s^3 + 24s^2 + 23s + 15 = 0$. Determine the location of roots on s-plane and hence the stability of the system.
- ii. Characteristic equation is $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 5 = 0$
7. What are the different frames used in inertial navigation? Explain. (20)
- OR**
8. An aircraft cruising at 150 kmph on autopilot mode is given a reference pitch angle of 20 degrees. The autopilot control system has a transfer function as follows. Determine the stability of the system with a neat sketch of rootlocus. (20)
- $$G(s) = \frac{K}{s(s^2 + 4s + 13)}$$
9. Explain radar systems command & housing guidance systems. (20)
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Wishing you All the Best
