



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)**

08.805 : Elective IV (f) : CONTROL AND GUIDANCE ENGINEERING (E)

Time : 3 Hours

Max. Marks : 100

- Instructions :** 1) Answer **all** questions from Part A.
2) Answer **three** questions from Part B choosing **not** more than **one** question from **each** Module.

PART – A

1. State and explain Kepler's law of planetary motion.
2. What is an inertial frame ? Why it is needed ?
3. What is meant by Euler angles as referred to navigation systems ?
4. Explain the term guidance as applied to aerospace systems.
5. Explain the term attitude control of satellite.
6. Explain the functions of inertial navigation system.
7. What is the basic working principle of TDF and SDF Gyros ?
8. Comment on the performance of Strapdown INS and Gimbaled INS.
9. What is GPS ? What are the applications of GPS ?
10. What is the use of VOR and DME in guidance of aerospace vehicles ?



PART – B

Module – 1

11. a) Define navigation and explain the various schemes adopted for implementing them. **10**
- b) What is the significance of co-ordinate transformation in aerospace systems ? **10**

OR



12. a) A point in space is represented by the co-ordinate as (L, O, r) . Obtain the true coordinates of the system with respect to ECI frame. 10
- b) What is meant by Quaternion representation in co-ordinate transformation? What are the advantages of Quaternion method of representation over other methods of transformation. 10

Module – 2

13. a) Give an account of guidance requirement for the orbital maintenance of satellites. 10
- b) Derive the transfer function of gyroscope. Differentiate between rate gyro and integrating gyro. 10

OR

14. a) Give an account of the performance parameter of accelerometer. With necessary diagram explain the working of vibrating string accelerometer. 10
- b) What is meant by Schuler turning? How Schuler turning is used in aerospace systems. 10

Module – 3

15. a) Explain the mechanization of strap down INS. 10
- b) What is meant by Gyro compassing? How it is used in navigation systems? 10

OR

16. a) Explain with suitable examples externally aided navigation scheme applied to aerospace vehicle. 10
- b) Explain the basic requirements of satellite navigation system. 10
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