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BAS-025

B.Tech. IN AEROSPACE ENGINEERING (BTAE)

00134

Term-End Examination

June, 2014

BAS-025 : SPACE DYNAMICS

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. Use of scientific calculator is **permitted**. Assume data suitably.*

1. Explain the general aspects of satellite injection. **10**

2. Sketch the velocity hodographs for elliptic, parabolic and hyperbolic motion and explain them in detail. **10**

3. Write and explain factor's behind perturbation of Satellite's orbit and its positions. **10**

4. State Kepler's laws. An earth bound satellite is so positioned that it appears stationary to an observer on the earth and serve the purpose of a fixed relay station for intercontinental transmission and other communications. What would be the height at which the satellite should be positioned and the direction of its motion ? **10**

5. Explain fully all the features of entry trajectory of a ballistic missile. **10**

6. (a) Derive the equation of orbit for a spacecraft moving in gravitational field of the earth. 6

(b) Explain various approximate models of motion that are used to study the motion of a spacecraft. 4

7. Explain three types of entry paths possible while the spacecraft enters the atmosphere. Also describe Entry Corridor. 10

8. Show with proper derivation how the trajectory of a spacecraft is defined by the conditions at burnout. Also mention which are the necessary conditions for the spacecraft to escape the gravitation at the earth. 10

9. (a) Explain different types of maneuvers used in a rocket. What types of propulsion systems are used to carry out these maneuvers ? 5

(b) If a spacecraft is circling the earth in an orbit 700 km above the surface of earth and if the spacecraft has to be put into an elliptical orbit with moon at the Apogee, what velocity increment has to be given ? Neglect the gravitation of the moon. 5