Eighth Semester B.Tech Degree Examination, April/May 2016

(2008 scheme)

Branch: Aeronautical Engineering

08.804: SPACE TECHNOLOGY

Time:**3** Hours Max.Marks:100

Answer all questions from part-A and one full question from each module of Part-B.

PART-A

1. What you mean by earth's equatorial plane and ecliptic?
2. Write short notes on the following: a) Orbital velocity b) Escape velocity
3. Explain in detail Universal time and side real time.
4. Explain relativistic effects.
5. Derive inverse square field law.
6. Write a short note on planetary flyby.
7. Derive and explain Lambert's theorem.
8. Explain the staging of rockets.
9. Explain about orbit drift.
10. Derive Hohmann transfer.

(10X4=40)

PART-B

MODULE-1

11. a) i) Explain with mappings about the celestial body. (8)

    ii)Explain reference frames and its types. (12)

    (or)

    b) i) Derive and explain motion in accelerated reference planes. (20)

MODULE-2

12. a). Consider an initial, low earth orbit at a 300km altitude . Find the velocity change that is required to produce an elliptical orbit with a 300km altitude at periapsis and a 3000km altitude at appoapsis. Given μ, the gravitational parameter for earth =398600.4 km^3/s^2 and radius of earth 6378.14km. (20)

(or)

b) .i) Describe the re-entry process of a space vehicle. Explain the features of the vehicle which attracts the attention of its designer . Bring out major constraints involved in its design as well. (20)

MODULE-3

13.a). i)Derive thrust and rocket equation. (10)

ii) Explain any two types of thrust vector control. (10)

(or)

b). i) Explain in detail about fundamentals of rocket propulsion (10)

ii) Explain two types of attitude control (10)

(3X20=60)