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BAS-025

B.Tech. AEROSPACE ENGINEERING (BTAE)

Term-End Examination

00125 **December, 2016**

BAS-025 : SPACE DYNAMICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. All questions carry equal marks. Use of scientific calculator is permitted.*

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

2. State Kepler's laws. Calculate the height at which a geostationary satellite should be positioned. *10*

3. (a) Derive the equation of orbit for a spacecraft moving in the gravitational field of the Earth. *5*

(b) Explain the various approximate models of motion that are used to study the motion of a spacecraft. *5*

4. Discuss the influence of ratio of injection and re-entry radius ρ_1 and flight path angle γ_1 on the angular range of a missile. *10*

5. What is the difference between Keplerian orbits and perturbed Keplerian orbits ? *10*

6. Explain the difference between chemical rocket propulsion and electrical rocket propulsion systems used for spacecraft flights, with suitable diagrams. *10*

7. Explain the reference frame where the Sun is taken as origin and compare it with the reference frames usually considered for satellite orbits. *10*

8. Describe Cowell's method and Encke's method in detail. *10*

9. Explain the launch site and launch azimuth velocity penalty by making use of a plot. *10*