No. of Printed Pages : 2

BAS-025

B.Tech. AEROSPACE ENGINEERING (BTAE)

00333 Term-End Examination

December, 2018

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

2. Derive an expression for the escape velocity of a satellite from the Earth's surface. *10*

3. Explain the difference between Keplerian orbit and Perturbed Keplerian orbit. *10*

4. Explain the following terms with the help of neat diagrams : *5×2=10*

(a) Synodic time

(b) Lambert's equation

(c) Swing-by flights

(d) Rendezvous mission

(e) Baker's equation

5. (a) Derive and explain Kepler's first law.

(b) Explain how one can estimate the classical elements of an orbital from single radar sighting. *5+5*

6. (a) Discuss the launch opportunities for an interplanetary mission, with the help of a suitable diagram.

(b) Describe fast interplanetary trajectories. *5+5*

7. Explain the stability of motion near the liberation point. Make use of sketches and examples. *10*

8. Explain in detail all the features of entry trajectory of a ballistic missile. *10*

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

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