

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- VIII (New) EXAMINATION – WINTER 2019

Subject Code: 2180103
Date: 21/11/2019
Subject Name: Space Dynamics
Time: 02:30 PM TO 05:00 PM
Total Marks: 70
Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Is there gravity in space? Justify.	03
	(b) Explain Newton's law of gravitation in detail.	04
	(c) Define Space. Classify types of space vehicles.	07
Q.2	(a) Explain Mechanics of Circular Orbit.	03
	(b) State and Prove Kepler's 3 rd law.	04
	(c) With neat sketch explain different types of space trajectories.	07
	OR	
	(c) Explain The Two body problem.	07
Q.3	(a) State and Prove Kepler's 2 nd law.	03
	(b) Explain Zero potential energy configurations.	04
	(c) Derive Orbit equation.	07
	OR	
Q.3	(a) What is Escape Velocity? Calculate the same for an object escaping from the earth's surface.	03
	(b) Write a note on Elliptic orbit.	04
	(c) With neat sketch explain The Hohmann transfer ellipse.	07
Q.4	(a) What is Attitude maneuvering?	03
	(b) Why the stability of Satellite is very important? Write methods for stability control of satellites.	04
	(c) What are the major sources of Attitude disturbance torques? Explain any one in detail.	07
	OR	
Q.4	(a) Establish a relation between Impulse and change in momentum.	03
	(b) What do you mean by Dual spin satellite? Explain the functions of Rotor & Platform with labeled diagram.	04
	(c) Write a short note on Yo-Yo Mechanism.	07
Q.5	(a) What is (a) Re-entry corridor (b) Overshoot boundary & (c) Undershoot boundary?	03
	(b) How Re-entry is more important in (a) Ballistic missiles (b) Planetary entry probes & (c) Manned spacecraft.	04
	(c) Explain Motion of Re-entry objects using Motion Analysis Process (MAP).	07
	OR	
Q.5	(a) How re-entry mission is designed? Explain using block diagram.	03
	(b) What are the functions of (a) Heat Shield & (b) Back Shell?	04
	(c) Compare a study between Sphere, Cone & Blunted cone. And prove using parameters like Deceleration, Heat rate, Accuracy why Blunted cone shape is preferable for Re-entry vehicle design.	07
