Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2180103 **Date: 04/05/2017**

Subject Name: Space Dynamics

Time: 10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

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

Q.1	**(a)**		Explain different types of entry paths.	**07**
	(b)		With neat sketches explain different trajectories and its physical significance.	**07**
Q.2	**(a)**	i.	Is there gravity in Space? Yes or No. Explain in detail.	**07**
		ii.	Which are the different phases of Space mission?	
	(b)	i.	Find the values of velocity required to obtain a circular orbit and parabolic trajectory for earth.	**07**
		ii.	Explain zero potential energy configuration.	
			OR	
	(b)		Derive Angular momentum and Energy using wheel and axle theory.	**07**
Q.3	**(a)**		What is Gyrostat? Explain the working of Rotor and Platform with neat sketch.	**07**
	(b)		From orbit equation, derive formula to calculate eccentricity in terms of the difference between kinetic energy and potential energy.	**07**
			OR	
Q.3	**(a)**		Prove that the squares of periods of any two satellites about the same planet are directly proportional to the cube of length of their semi major axis.	**07**
	(b)		Write a note on Elliptic orbit.	**07**
Q.4	**(a)**		Derive general equation of motion for a vehicle entering the atmosphere.	**07**
	(b)		Write a note on Entry Heating.	**07**
			OR	
Q.4	**(a)**		Write a note on the Two-body problem.	**07**
	(b)		Write a short note on Minimum energy path for interplanetary mission.	**07**
Q.5	**(a)**		Write a note on Circular orbit. Make necessary comments.	**07**
	(b)		Write a note on Escape Velocity.	**07**
			OR	
Q.5	**(a)**		What do you mean by Rigid Body? Obtain the following equation of external force acting on rigid body using Newton's law of motion. $F_e = M \times (d^2r_c) / (dt^2)$ Where, r_c = Position of centre of mass	**07**
	(b)		What do you mean by Dual Spin Satellite? Explain the working of it with neat sketch.	**07**

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