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

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:180103 **Date:29/04/2017**

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)**		Define Space. Classify Space vehicles.	**07**
	(b)		Explain Newton's law of gravitation in detail.	**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 velocities required to obtain a circular orbit and parabolic trajectory for earth.	**07**
		ii.	Explain zero potential energy configuration.	
			OR	
	(b)		Write a note on the Two-body problem.	**07**
Q.3	**(a)**		Derive Orbit equation.	**07**
	(b)		Using 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)		Explain Entry heating. Also obtain an equation for aerodynamic heating rate.	**07**
			OR	
Q.4	**(a)**		Write a note on Deep Space.	**07**
	(b)		Write a short note on Hohmann transfer ellipse.	**07**
Q.5	**(a)**		Write a note on Circular orbit. Make necessary comments.	**07**
	(b)		Define and discuss Escape Velocity.	**07**
			OR	
Q.5	**(a)**		Explain different types of entry paths.	**07**
	(b)		With neat sketches explain different trajectories and its physical significance.	**07**

****