CBCS SCHEME

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BAE405C/ BAS405C

Fourth Semester B.E./B.Tech Degree Examination, June/July 2024
Introduction to Space Technology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Describe about near earth space mission and deep space mission.	10	L1	CO1
	b.	Explain in detail about solid propellant rocket with its advantages and disadvantages.	10	L2	CO1
		OR			
Q.2	a.	Explain in detail about liquid propellant rocket with its advantages and disadvantages.	10	L2	CO1
	b.	Derive Tspolkovsky rocket equation.	10	L2	CO2
		Module – 2			
Q.3	a.	Derive the general equation of motion for atmospheric Re-entry.	10	L1	CO1
	b.	What is Re-entry dynamics? Derive Balrstic R-entry equation.	10	L2	CO2
		OR			
Q.4	a.	Derive double dip re-entry. What was the re-entry velocity of apology 10?	10	L3	CO1
	b.	Consider a solid mass in the shape of sphere entering an earth at 13km/sec and $\theta = 15°$ below the local horizontal, sphere diameter is 1m the drag coefficient at hypersonic speed is 1. The density of mass PS 6963kg/m^3. Calculate the altitude at which maximum deceleration occur, and the value of maximum declaration and also the velocity at which sphere would impact the earth's surface.	10	L3	CO2
		Module – 3			
Q.5	a.	What is orbital mechanics? Derive the two body problem.	10	L2	CO2
	b.	What is Hohmann transfer and what is its application of interplanetary travel.	10	L3	CO2
		OR			
Q.6	a.	Explain briefly about Bielliptical transfer and plane change.	10	L2	CO2
	b.	Design a Hohmann transfer from a circular mars orbit of radius 8000km to a circular mars orbit of radius 15,000km. From appendix C, for Mars μ = 398600 km^3/sec^2.	10	L3	CO2
		Module – 4			
Q.7	a.	Write short notes on attitude control for spinning and no-spinning spacecraft.	10	L1	CO3
	b.	Describe about attitude determination.	10	L1	CO3
		OR			
Q.8	a.	Derive the Yo–Yo mechanism.	10	L1	CO3
	b.	Write short notes on Gravity Gradient Satellite.	10	L2	CO3
		Module – 5			
Q.9	a.	Explain in detail about the supporting ground systems architecture in space mission.	10	L3	CO3
	b.	Explain about mission phases.	10	L3	CO3
		OR			
Q.10	a.	Explain in detail about telemetry systems in space in space mission.	10	L3	CO3
	b.	Explain in detail about command, planning, tracking in space mission.	10	L3	CO3

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