U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations

Programme: B.E. **Semester: IV**

Branch: Aerospace Engineering **Duration: 3 hrs.**

Course Code: 23AS4ETIST **Max Marks: 100**

Course: Introduction to Space Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

			UNIT - I	CO	PO	Marks
1	a)		i) How does the Star form? What are the criteria for a star to become a neutron star at the end stage of its life? ii) What is the difference between a planetary nebula and a supernova?	*CO1*	*PO1*	**10**
	b)		Briefly describe i) Three different types of satellites with examples. ii) PSLV and GSLV space launchers.	*CO1*	*PO1*	**10**
			UNIT - II			
2	a)		Write down Newton's law of gravitation. Derive the expression for Gravitational Potential Energy.	*CO1*	*PO2*	**6**
	b)		What do you understand by two-body problems in classical mechanics? State Kepler's laws of planetary motion.	*CO1*	*PO1*	**6**
	c)		Describe with a neat diagram, the six classical orbital elements to define a particle moving in orbit.	*CO1*	*PO1*	**8**
			OR			
3	a)		Derive the expression for the kinetic energy of a rigid body.	*CO1*	*PO2*	**6**
	b)		What do you understand by orbital maneuver? Describe different types of orbital maneuvers.	*CO1*	*PO1*	**6**
	c)		What are the major factors influencing the orbital perturbations?	*CO1*	*PO1*	**8**
			UNIT - III			
4	a)		i) Describe Planck's law of electromagnetic radiation.	*CO2*	*PO1*	**10**

			ii) Define solar wind and solar flare.			
		b)	Briefly describe the effects of the space environment on spacecraft.	*CO2*	*PO1*	**10**
			OR			
	5	a)	Write down the rocket thrust equation. From the equation, state the factors that are responsible for the rocket thrust.	*CO2*	*PO2*	**6**
		b)	Describe briefly the interaction of solar wind with geomagnetic field.	*CO2*	*PO1*	**6**
		c)	Briefly describe different types of propulsion systems.	*CO2*	*PO1*	**8**
			UNIT - IV			
	6	a)	Write down the components of a typical communication system.	*CO3*	*PO1*	**6**
		b)	Briefly describe the propagation characteristics of Direct Waves, Ground Waves, Sky Waves, and Space Waves.	*CO3*	*PO1*	**8**
		c)	What do you understand by remote sensing? Define passive and active sensors for remote sensing.	*CO3*	*PO1*	**6**
			UNIT - V			
	7	a)	Describe the Attitude Control and Reference Subsystem and Thermal Subsystem of any spacecraft.	*CO4*	*PO1*	**8**
		b)	Briefly describe the ground support system, used as a part of the space system.	*CO4*	*PO1*	**6**
		c)	Discuss the System Life Cycle as a part of the system approach in designing complex systems such as spacecraft.	*CO4*	*PO1*	**6**

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