U.S.N.										

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

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main 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.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	i) Briefly describe three different types of satellites with examples. ii) Briefly describe the Apollo 11 mission.	*CO1*	*PO1*	**10**
	b)	What is space. Does the space is completely empty or it contains some substances?	*CO1*	*PO1*	**6**
	c)	Briefly describe Chandrayaan-3 mission objectives.	*CO1*	*PO1*	**4**
		OR			
2	a)	What are the primary functions of a Spacecraft? Classify four different types of spacecrafts and briefly describe their mission objectives.	*CO1*	*PO1*	**15**
	b)	Define the orbit of any celestial object. What are the differences between orbital flight and sub-orbital flight?	*CO1*	*PO1*	**5**
		UNIT - II			
3	a)	i) Define Geosynchronous Orbit (GSO), Low Earth Orbit (LEO), Medium Earth orbit (MEO), Polar Orbit, Geostationary Transfer Orbit (GTO), and the specific advantages of using those orbits. ii) Write down the types of satellites used in GSO, MEO, and LEO.	*CO1*	*PO1*	**12**
	b)	i) State three primary characteristics of central force motion. ii) Derive an expression for gravitational potential energy.	*CO1*	*PO1, PO2*	**8**
		OR			
4	a)	Describe with a neat diagram, the six classical orbital elements to identify a specific orbit.	*CO1*	*PO1*	**10**
	b)	What do you mean by orbital maneuvers? Why is it required? Explain different types of orbital maneuvers.	*CO1*	*PO1*	**10**

			UNIT - III			
	5	a)	With a neat sketch, briefly describe six layers of the Sun.	*CO2*	*PO1*	**10**
		b)	Write down Planck's Law and Stefan-Boltzmann Law of electromagnetic radiation.	*CO2*	*PO1*	**10**
			OR			
	6	a)	Briefly describe different types of propulsion systems.	*CO2*	*PO1*	**10**
		b)	Derive the rocket equation from Newton's second law of motion.	*CO2*	*PO1, PO2*	**10**
			UNIT - IV			
	7	a)	Write down the components of a typical communication system. Briefly explain how a signal can be transmitted from one place to another.	*CO3*	*PO1*	**10**
		b)	i) What do you understand by Remote sensing? ii) Briefly describe how satellite navigation works.	*CO3*	*PO1*	**10**
			OR			
	8	a)	Briefly describe the propagation characteristics of direct waves, ground waves, sky waves, and space waves.	*CO3*	*PO1*	**12**
		b)	What do you understand by modulation and demodulation? Briefly describe amplitude modulation, frequency modulation, and phase modulation.	*CO3*	*PO1*	**08**
			UNIT - V			
	9	a)	Using an appropriate table discuss the system approach in the design of complex systems such as spacecraft.	*CO4*	*PO1*	**10**
		b)	What is a satellite bus? Point out and describe four satellite bus subsystems.	*CO4*	*PO1*	**10**
			OR			
	10	a)	Describe the basic elements of satellite systems.	*CO4*	*PO1*	**10**
		b)	Briefly describe ground support system for the space system.	*CO4*	*PO1*	**10**

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