Duration: 3hrs **[Max Marks: 80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1		**Attempt any FOUR**	**[20]**
	a	Describe 3-axis stabilization.	**[5]**
	b	What do you mean by earth eclipse of satellite?	**[5]**
	c	What are losses involved in satellite communication and how they are minimized?	**[5]**
	d	Explain Telecommand format for nanosatellite.	**[5]**
	e	Compare LEO, MEO and GEO.	**[5]**
2	**a**	What do you understand by orbital perturbations? Give main causes of orbital perturbation.	**[10]**
	b	Derive an expression for overall uplink and downlink C/N ratio. For a satellite circuit the carrier-to-noise ratios are uplink 23dB, downlink 20dB, and intermodulation 24 dB. Calculate the overall carrier- to-noise ratio in decibels.	**[10]**
3	**a**	Why do you require deployment mechanisms in nanosatellite and which are the critical elements in deployment mechanisms?	**[10]**
	b	Discuss Limits of Visibility with its derivation.	**[10]**
4	**a**	Derive general link equation and also explain system noise temperature.	**[10]**
	b	List and describe the materials used for nanosatellite structure.	**[10]**
5	**a**	What do you mean by active thermal control and what are the different techniques used for it w.r.t. nanosatellite?	**[10]**
	b	Describe receive only earth station in detail.	**[10]**
6	**a**	Write short note on: i) input and output backoff ii) Orbit Control System	**[10]**
	b	What are the different types of nano satellite structure design?	**[10]**

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