

**Q.P. Code : 852600**

**(3 Hours)**

**[Total Marks : 80]**

- N.B.** 1) Question No.1 is compulsory.  
2) Attempt any three from remaining.  
3) Assume suitable data if necessary.



1. (a) Briefly describe the following: 05  
(i) Why does a satellite in highly inclined elliptical orbit spend most of its orbital period over higher latitude regions?  
(ii) Why is it preferable for a remote sensing satellite to be in Sun synchronized orbits?
- (b) Explain: 05  
(1) Lobe switching (2) mono pulse tracking (3) step tracking (4) intelligent tracking.
- (c) Why the control system in satellite waits for an execute command after receiving the command to be executed? 05
- (d) Differentiate between window and frame organization. 05
2. (a) Explain: 10  
1) Why a spin stabilized satellite uses relatively large number of solar cells as compared to three axis stabilized satellite for the same power requirement?  
2) Why are storage batteries used along with solar arrays?
- (b) What is the antenna noise temperature? What are the major factors that decides the antenna noise temperature? What is the antenna gain to noise temperature (G/T) ratio? What is the significance of Earth stations antenna gain to noise temperature ratio? 10
3. (a) Explain thermal sub-system. What are the methods of thermal control in satellite? 10  
(b) What are the different types of lasers used for satellite communication? Explain photo detector noise model.

**(TURN OVER)**



4. (a) With the help of a block diagram describe the working of transmit receive earth station used for telephone traffic. 10
- (b) Explain in detail the operation of the Spade system of demand assignment. Explain what is meant by thin route service? Suggest the type of satellite access is most suitable for this service. 10
5. (a) An earth station employs a power amplifier providing an output power of 100W and an antenna of 5m diameter for both transmission and reception. The transmission frequency is 6.25 GHz and receiving frequency is 4.5 GHz. System noise temperature is 140 K. Find EIRP and G/T ratio. 10
- (b) What is limit of visibility of satellite? How it is calculate? 05
- (c) Explain what is meant by earth eclipse of an earth- orbiting satellite? Why it is preferable to operate with a satellite positioned west rather than east, of earth station longitude? 05
6. (a) How the reliability of the earth station is improved? 08
- (b) Draw and explain the satellite network architecture. 08
- (c) Explain Unique word detection. 04

\*\*\*\*\*