QP Code : 629201

(3 Hours)   [Total Marks : 100

N.B. : 1) Question No 1 is compulsory.
        2) Attempt any four questions from question No 2 To 7.
        3) Assume suitable Data Wherever necessary and justify the same.
        4) Draw neat sketches/diagrams wherever Necessary.

1. Answer the following (any four)
    (a) State and explain Keiper's laws? And show that a $_{GSO}$ = 42,000 km.   5
    (b) What is meant by polarization of satellite signals and why circular polarization   5
         is preferred in satellite applications?
    (c) Compare LEO, MEO, GEO satellites?   5
    (d) Briefly explain sun transit outage?   5
    (e) What are the differences between GEOSynchronous GEOstationary orbits?   5

2. (a) Discuss design criteria and problems encounter by communication satellite   10
         and mention different sub systems of satellite?
    (b) Draw block diagram of transmit received earth station and explain each block?   10

3. (a) What is telemetry, tracking and command sub system? And explain it's working   10
         with necessary block diagrams?
    (b) Compare spin stabilization and 3-axis stabilization methods. Mention their   10
         advantages and disadvantages?

4. (a) Explain different types of double reflector antennas used in satellite   10
         communication?
    (b) Explain briefly importance of reliability, qualification and Bath tub curve?   10

5. (a) What are look angles? An earthstation is located at latitude 30^0S and longitude   10
         130° E, calculate antenna look angles for satellite at 156° S?
    (b) Discuss different launching mechanism of satellite in GEOstationary orbit   10
         with necessary diagrams?

[TURN OVER

6. (a) A satellite circuit has the following parameters: 10

	Uplink, decilogs	Downlink, decilogs
[EIRP]	54	34
[G/T]	0	17
[FSL]	200	198
[RFL]	2	2
[AA]	0.5	0.5
[AML]	0.5	0.5

Calculate the overall [C/N_0] values.

(b) Why TWT is preferred for satellite communication and multiple careers   10
operations? Explain 1 dB compression point? And what is the significant of
this point in relation to operating point of TWT?

7. Write short notes on **any two** :-   20
   (a) Orbital perturbations with equations
   (b) Double conversion Transponders
   (c) SPADE system
   (d) VSAT and GPS