Q.P. Code : **2712**

(3 Hours) [Total Marks :100

N.B. : (1) Question **No.1** is **compulsory**

(2) Attempt any **four** questions from questions 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 Kepler's laws? And show that a_{Gso} = 42,000 km. 5
   (b) What is meant by polarization of satellite signals and why circular 5
   polarization 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 GEO Synchronous and GEO stationary 5
   orbits?

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 10
   working 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 10
   longitude 130^0 E, calculate antenna look angles for satellite at 156^0E?
   (b) Discuss different launching mechanism of satellite in GEO stationary 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 operations? Explain 1 dB compression point? And what significant of this point in relation to operating point of TWT? 10

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