(53) BE - sem-VIII - EXTC - Rev

SC 20/5/15

QP Code : **8109**

(3 Hours) [**Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining.
(3) Assume suitable data if necessary with justification.

1. Answer the following (any **four**) :– **20**
   (a) Why should the satellite velocity at the apogee point always be less than the velocity at the perigee point.
   (b) Explain why is it not possible to have an elliptical satellite orbit with zero ecentricity.
   (c) Why do we need to have an isotropic antenna on board the satellite?
   (d) Compare and contrast prime focus fed parabolic reflector antenna, offset feed parabolic reflector antenna and cassegrain antenna for use as an Earth station antenna.
   (e) Explain what is meant by orthogonal polorization and the importance of this in satellite communication.

2. (a) How do you define an "orbital cycle" in the case of a satellite in a sun-sunchronous orbits? What is its significance when it comes to earth observation application? **6**
   (b) Briefly describe the important charateristics and the preferred uses of the following orbits. **6**
      (i) Molniya orbit
      (ii) Sun-sunchronous orbit
      (iii) Geostationary orbit
   (c) With the help of a block diagram briefly describe the functions of the important constituent part of a typical large size earth station. **8**

3. (a) Explain the propagation impairment which most affect transmission in the C-band and ku-band. **8**
   (b) Why is faraday rolation of no concern with circularly polorized waves? Explain how depolorization is caused by rain. **6**
   (c) What do you understand by link budget of a satellite communication link? What type of information do you get from such an analysis. **6**

4. (a) Explain in detail the operation of the SPADE system of demand assignment. What is the function of the common signalling channels? **10**
   (b) Describe the TTC facilities of a satellite communication system. **10**

[**TURN OVER**

5. (a) Derive equation for carrier-to-noise ratio. 6
   (b) Explain :– 8
      (i) Input back off and out put back off
      (ii) Uplink rain-fade margin and down link rain-fade margin.
   (c) Define and explain the term 1-dB compression point. What is the significance of this point in relation to the operating point of a TWTA? 6

6. (a) Explain network synchronization in TDMA system. 10
   (b) Explain what is meant by the term despun antenna and briefly describe any one way in which the despinning is achieved? Briefly describe the three-axes method of satellite stabilization. 10

7. Write short notes on (any **four**) :– 20
   (a) Reliability and space qualification
   (b) Electrical power sub-system
   (c) Tracking Technique used in satellite
   (d) AM to PM conversion
   (e) Orbital parameters
