

- N.B. : (1) Question No. 1 is compulsory.  
 (2) Attempt any four questions from Q. Nos. 2 to 7.  
 (3) Draw neat sketches/diagrams, wherever necessary.  
 (4) Make suitable assumptions wherever necessary and justify.  
 (5) Figures to the right indicate full marks.
1. (a) What are Geosynchronous satellites ? What are the advantages and disadvantages of Geosynchronous satellites ? 20  
 (b) Discuss the frequencies used by C-band satellite. Why is the uplink frequency different from the down-link frequency ?  
 (c) Define :-  
     (i) Processing gain  
     (ii) Jamming margin.  
 (d) What is a transponder ? Explain single conversion transponder.
  2. (a) State and explain Kepler's laws. 10  
 (b) Compare low altitude, medium altitude and high altitude satellites. 10
  3. (a) What is telemetry, tracking and command subsystem ? Explain its functioning with block diagram. 10  
 (b) Draw a block diagram for transmit – receive type earth station. Explain each block in brief. 10
  4. (a) What do you understand by reliability and space Qualification ? Explain the significance of bath tub curve. 10  
 (b) Which are the different methods of launching a satellite ? Explain clearly. 10
  5. (a) Compare :- 20  
     (i) FH – CDMA and DS – CDMA.  
     (ii) Uplink power requirement for FDMA and TDMA.
  6. (a) The transponder bandwidth for CTS satellite system is 36 MHz and free space loss in uplink is 207.3 dB, other parameters of uplink are :- 12  
     Atmospheric attenuation = 0.18 dB  
     Ground station transmitter power output = 17.86 watts.  
     Feeder loss = 0.15 dB  
     Ground station antenna gain = 59.69 dB  
     Satellite antenna gain = 38 dB  
     Satellite system temperature = 1349 K.  
     Calculate :  
     (i) Satellite received carrier level in dBW.  
     (ii) Satellite received noise power.  
     (iii) C/N ratio in dB at satellite input.  
 (b) Explain different types of antenna used in satellite communication. 8
  7. Write short notes on (any two) :- 20  
     (a) Different modulation techniques used in satellite communication.  
     (b) VSAT  
     (c) Feedsystem in Earth stations.