

2006 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS
SATELLITE COMMUNICATIONS
 (ELECTRONICS & COMPUTER ENGINEERING)

Apr/May 2006

TIME – 3 HOUR
 MARK – 80

Answer any FIVE Questions
All Questions carry equal marks

1. List the various frequency bands being used in satellite communication. Compare the advantages and disadvantages of different bands considering the effects of propagation media. [16]
2. (a) Why is it necessary to estimate the frequency shift caused by Doppler effect when dealing with satellite communication? [8]
- (b) A geosynchronous satellite moving in an equatorial circular orbit at a height of 35000km above the surface of the earth gets inclined at angle of 2 degrees. Calculate the maximum deviation in latitude and also the maximum deviation in longitude. Determine maximum displacements in km caused by latitude and longitude displacements. [8]
3. (a) What is spin stabilization? Why is it necessary? Explain various effects that is to be avoided and its remedial solution. [8]
- (b) What is station keeping? Explain various methods of station keeping. [8]
4. What is faraday's rotation? How it affects the satellite communication? Explain how it is eliminated. [16]
5. (a) Suppose we have a 4-GHZ receiver with the following gains and Noise temperatures. [8]
 $T_{in} = 50k$
 $TRF = 50k$
 $T_m = 500k$
 $TIF = 1000k$
 $GRF = 23dB$
 $G_m = 0dB$
 $GIR = 30dB$ Calculate the system Noise temperature.
- (b) If in the above example a section of lossy wave guide is inserted between antenna and RF amplifier. Find the new system noise temperature. [4]
- (c) By what range the insertion of the lossy wave guide increases the over system noise temperature, measured at the CNA input. What will be the Carrier-to Noise ratio. [4]
6. Explain the Frequency Division Multiple Access of Satellite System with one example.
7. (a) Describe the various function to be carried out by satellite launching earth station satellite is launching. [8]
- (b) Explain the operation on deriving mechanism of Antenna employed in the earth station. [8]
8. (a) Explain how the power level of the signal is raised in satellite communication? Which device is used for power rising? And write its function. [8]
- (b) Explain the operation of TWT amplifier? Explain its structure required for reliable operation?