

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0313

Roll No.

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B. Tech.

(SEM. VII) ODD SEMESTER THEORY EXAMINATION
2010-11

SATELLITE COMMUNICATION

Time : 3 Hours

Total Marks : 100

Note : Attempt all the questions.

1. Attempt any four parts :— (5×4=20)
 - (a) Explain different types of antenna used in Satellite Communication.
 - (b) What is the optimum G/T ratio for a standard earth station ?
 - (c) What are the factors that affect the uplink and downlink design ?
 - (d) Write short note on :
 - (i) Look, azimuths, elevation angle
 - (ii) Satellite axis.
 - (e) The semimajor and the semiminor axis of an elliptical satellite orbit are 20,000 km and 1600 km respectively. Determine the apogee and perigee distance.
 - (f) Explain geostationary satellite.

2. Attempt any four parts :— (5×4=20)

- Derive general link equation. Find out expression for C/N and G/T ratio.
- Discuss the antenna requirements for large and small earth station.
- What are the various interferences that may affect the satellite link performance? Explain.
- Two amplifiers are connected in cascades having a gain of 20 dB each. If the noise temperature is 200 K, determine the overall gain.
- The EIRP of a 240W transponder is 57 dBW. Calculate the approximate gain of the antenna if the transponder is switched to 120W, calculate the new [EIRP], assuming that the same antenna is used.
- Explain TT and C subsystem briefly.

3. Attempt any two parts :— (2×10=20)

- In a digital transmission $E_b/N_o = 11$ dB for a polar NRZ transmission over BPSK. The system uses 8 bits per level. Calculate the S/N ratio in dB with a block diagram, explain a typical PCM/TDM system.
- What is function of Demand Assignment control in DAMA system? Explain various such control systems.
- What is the difference between multiplexing and multiple access techniques? What is TDMA super frame? Explain its structure.

4. Attempt any two parts :— (2×10=20)

- Describe the Rain and ice effects on propagation.
- The generator matrix for a (6, 3) block code is shown below. Obtain all code of words of their code :

$$G = \begin{bmatrix} 1 & 0 & 0 & : & 0 & 1 & 1 \\ 0 & 1 & 0 & : & 1 & 0 & 1 \\ 0 & 0 & 1 & : & 1 & 1 & 0 \end{bmatrix}$$

- The parity check matrix of a (7, 4) linear block code is expressed as :

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & : & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & : & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & : & 0 & 0 & 1 \end{bmatrix}$$

Obtain the generator matrix (G) and list of all code vectors.

5. Attempt any two parts :— (2×10=20)

- Explain DBS home receiver with block diagram.
- State and explain the various segments of GPS system.
- Write short note on any two :
 - VSAT
 - LEO satellites for internet transmission
 - Non Geo-stationary satellites.