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

PAPER ID : 0313 Roll No. | | | | | | | | | | |

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)**

(a) Derive general link equation. Find out expression for C/N and G/T ratio.

(b) Discuss the antenna requirements for large and small earth station.

(c) What are the various interferences that may affect the satellite link performance ? Explain.

(d) Two amplifiers are connected in cascades having a gain of 20 dB each. If the noise temperature is 200 K, determine the overall gain.

(e) 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.

(f) Explain TT and C subsystem briefly.

3. Attempt any **two** parts :— **(2×10=20)**

(a) In a digital transmission E_b/N_o = 11dB for a polar NRZ transmission over BPSK. The system uses 8 bits per level . Calculate the S/N ratio in dBS with a block diagram, explain a typical PCM/TDM system.

(b) What is function of Demand Assignment control in DAMA system ? Explain various such control systems.

(c) 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)**

(a) Describe the Rain and ice effects on propagation.

(b) The generator matrix for a (6, 3) block code is shown below. Obtain all code of words of their code :

$$G = \left[\begin{array}{ccc:ccc} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{array}\right]$$

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

$$H = \left[\begin{array}{cccc:ccc} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{array}\right]$$

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

5. Attempt any **two** parts :— **(2×10=20)**

(a) Explain DBS home receiver with block diagram.

(b) State and explain the various segments of GPS system.

(c) Write short note on any **two** :

(i) VSAT

(ii) LEO satellites for internet transmission

(iii) Non Geo-stationary satellites.