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B.E./B.Tech.(Full-Time)DEGREE END SEMESTER EXAMINATION,APRIL/MAY2012

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

EIGHTH SEMESTER

EC 9031 – SATELLITE COMMUNICATION

(REGULATIONS 2008)

Duration: 3 Hours

Max.marks: 100

Answer ALL questions

PART-A

(10x2=20Marks)

1. Write the equation for total energy of a satellite for a two body system.
2. State Kepler's laws.
3. Why does power failure occur in satellite?
4. What do antennas required for satellite and earth stations depend on?
5. Draw the spectrum of a baseband voice signal.
6. When does ARQ technique fail?
7. Why is PAMA called fixed assigned MA?
8. Define pseudo random sequence.
9. List the interacting components of NAVSTAR GPS.
10. Write the role of intelligence gathering satellite.

PART-B

(5X16=80 Marks)

- 11.(i) Derive the equations which permit the elevation angle to be calculated. **(8)**
- (ii) Tabulate the various types of orbits with their merits and demerits. **(8)**

12(a)(i) Consider a dual up converter with the following specifications:

Up link frequency spectrum = 14 to 14.5 GHz
 First intermediate frequency = 140 MHz
 Carrier bandwidth = 72 MHz
 BPF-1 Center frequency = 1.19 GHz

Determine first local oscillator frequency, range of second local oscillator frequency, frequency spectrum of unwanted sideband and bandwidths of BPF -1 and BPF -2. **(8)**

(ii) What are the effects to which the displacement in association with tracking feeds gives rise? How can tracking systems be affected? **(8)**

OR

12.(b)(i) From the calculation of system noise temperature prove that C/N ratio is directly proportional to G/T ratio. (10)

(ii) Consider the receive side of an earth station. The antenna gain is 65 dB and its noise contribution is 60 K. The waveguide loss is 0.5 dB. Determine the equivalent noise temperature of LNA assuming that the noise contribution by the down converter is negligible and earth station G/T is 40 dB/K ($T_o = 300$ K). (6)

13.(a)(i) With block diagram, constellation diagram and timing diagram, explain QAM. (8)

(ii) Draw the schematic for turbo coder and decoder and explain. (8)

OR

13.(b)(i) With diagram of a coherent BPSK detector derive the expression for PE and PB. (8)

(ii) With block and phasor diagrams derive the expression for PE and PB of QPSK. (8)

14.(a) Write the design aspects and explain the technical features of TDMA frame structure. (16)

OR

14.(b)(i) Draw the schematic for on board signal processing system for FDMA/TDM operation and explain. (8)

(ii) List the DAMA schemes based on economy and efficiency and define. (8)

15.(a) Tabulate payload, orbit and other features of weather satellite. (16)

OR

15.(b) (i) With block diagram explain the working principle of DBS-TV receiving system. (8)

(ii) Explain the function of each block of VSAT mini hub network configurations. (8)
