D 51337 (Pages : 2)

Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2008

EC 04 705 (D)—SATELLITE COMMUNICATION SYSTEMS

(2004 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. (a) Define (i) mean anomaly ; (ii) true anomaly ; and (iii) right ascension of the ascending node.
   (b) Explain the effect of atmospheric drag for near earth satellite.
   (c) Explain the three axis method of stabilization.
   (d) What is meant by step tracking ? Explain.
   (e) Explain how beam shaping of a satellite antenna radiation pattern may be achieved.
   (f) Explain the performance requirements of very small aperture terminals.
   (g) Explain the advantages and disadvantages of spread spectrum techniques.
   (h) Explain what is meant by random multiple access.

(8 × 5 = 40 marks)

Part B

2. (a) What is Hohmann transfer ? Explain the sequence of evetns during the launch of a geostationary satellite.

Or

(b) (i) What are the orbital parameters required to determine a satellite's orbit ? Name and explain them. (8 marks)

(ii) Explain the effects of a non-spherical earth on satellite orbit. (7 marks)

3. (a) (i) Explain what kind of electric power supply is used in a satellite. (7 marks)

(ii) Explain the working of thermal control sub-system ? What kind of thermal control sub-systems are being used in satellite ? (8 marks)

Or

(b) (i) What is meant by tracking and pointing ? Explain its significance and the techniques as to how these are achieved. (7 marks)

(ii) Draw the block diagram regenerative repeater and explain its function. (8 marks)

Turn over

4. (a) (i) Explain international regulation and frequency co-ordination for satellite service. (7 marks)

(ii) Explain what is meant by EIRP. A transmitter feeds a 15 watts into an antenna which has a gain of 50 dB. Calculate the EIRP in watts. (8 marks)

Or

(b) (i) Derive the link equations for satellite by considering intermodulation noise. (8 marks)

(ii) Explain what is meant by G/T ratio of a satellite receiving system. (7 marks)

5. (a) (i) Compare FDMA and TDMA. (6 marks)

(ii) What is TDMA superframe ? Explain its structure ? How is it different from a simple TDMA frame ? (9 marks)

Or

(b) Draw the block diagram of CDMA transmitter and receiver and explain each in detail. (15 marks)

[4 × 15 = 60 marks]