Register Number ……..

M.E DEGREE EXAMINATIONS: APRIL/MAY 2010

Second Semester

COMMUNICATION SYSTEMS

COM518: Satellite Communication

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. What are prograde and retrograde orbits?
2. What are the orbital parameters required to determine a satellite in orbit?
3. Depending on the type of the sub reflector used, classify the multiple reflector antennas.
4. What is a transponder?
5. Define EIRP.
6. What is Figure of merit?
7. List the three elements present in the TDMA reference burst.
8. Explain the Polling method in DA-FDMA.
9. What is DTH?
10. State applications of VSAT.

PART B (5 x 16 = 80 Marks)

11. (a) (i) How to locate a satellite in the orbit? Derive appropriate equations and give the procedure. (12)

(ii) Define Apogee and Inclination. (4)

(OR)

(b) Define look angle. Derive the expressions to determine the look angles.

12. (a) Explain how altitude and orbit control is achieved from an earth station.

(OR)

(b) Draw the general block diagram of an earth station and explain its major subsystems.

13. (a) (i) What are the two approaches to calculate the power received by an earth station from a satellite transmitter? Using the basic transmission theory, derive the link budget equation. (12)

(ii) A satellite at a distance of 40,000km from a point on earth's surface radiates a power of 3W from an antenna with a gain of 18dB in the direction of observer. Find the flux density at the receiving point and the power received by the antenna with an effective area of $10m^2$. (4)

(OR)

(b) What are the possible interference modes between the satellite circuits and a terrestrial station. Explain the interference between the satellite circuits by deriving the combined (C/I) due to interference on both uplink and downlink.

14. (a) Draw the frame structure and explain the classical TDMA technique.

(OR)

(b) Write notes on ATM over satellite.

15. (a) Explain in detail about

(i) GPS (8)

(ii) VSAT (8)

(OR)

(b) Explain in detail

(i) INMARSAT (8)

(ii) Email and Video Conferencing (8)

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