Code No.: 3204

FACULTY OF ENGINEERING

B.E. IV/IV Year (ECE) II Semester (Main) Examination, May/June, 2011

RADAR & SATELLITE COMMUNICATION SYSTEM

Time : 3 *Hours*] [*Max. Marks* : 75

Answer **all** *questions from Part A.*
Answer any **five** *questions from Part B.*

Part A – (Marks : 25)

1. State the Radar Frequency bands.
2. Define Radar cross Section of the target.
3. How do you distinguish the moving targets from Stationary targets.
4. What is a delay line canceller ? Classify them.
5. State Kepler's laws of orbit motion.
6. What do you mean by eclipse in case of Geostationary Satellite and when does it occur.
7. Define and explain the terms roll, pitch and yaw.
8. Briefly explain why up link frequency is higher than down link frequency.

Part B – (Marks : 50)

9. Derive Radar range equation in terms of Average power, Number of pulses integrated, Noise Figure and losses.
10. (a) Explain the principle of operation of multiple Frequency CW radar.
    (b) With the aid of a block diagram, explain fully the operation of an MIT system using a power amplifier in the transmitter.
11. (a) Explain in detail the operation of a phase comparison Tracking radar.
    (b) Compare amplitude and phase comparison monopulse Tracking radar.
12. (a) Contrast the advantages and disadvantages of Geosynchronous Satellites.
    (b) A Satellite is orbiting in a geosynchronous orbit of radius 41500 km. Find the velocity and time of orbit. What will be the change in Velocity if the radius reduces to 36000 km. If $u = 3.9861352 \times 10^5$ km^3/S^2.
13. Compose the mayor differences, advantages, disadvantages and applications of different multiple access techniques used in Satellite communication.
14. (a) Define system noise temperature and derive an expression for system noise temperature of a typical Satellite Transponder.
    (b) With relevant steps explain the design of Satellite links for specified C/N.
15. Short notes on Two of the following :
    (a) Telemetry, tracking and command control system.
    (b) Satellite data communication protocols.
    (c) Staggered PRF in MTI radar.