FACULTY OF ENGINEERING
B.E. 4/4 (ECE) II Semester (New) (Main) Examination, June 2010
RADAR AND SATELLITE COMMUNICATION SYSTEMS

Time: 3 Hours]

[Max. Marks: 75

*Note : Answer **all** questions from Part-**A**.*
*Answer **any five** questions from Part-**B**.*

PART – A   (25 Marks)

1. Explain the significance of Envelop Detector in Radar.   3

2. Define Minimum Detectable Signal.   2

3. What are blind speeds in MTI Radar ?   3

4. What is the requirement of Threshold detection in Radar ?   3

5. What is the purpose of Delay line canceller ?   2

6. Explain about sun transit outage for satellite.   3

7. Explain sub-satellite point with a diagram.   2

8. Differentiate between bent pipe transponder and double frequency conversation.   3

9. What do you understand by M for N redundancy in transponders ?   2

10. Differentiate C/N and S/N ratios in the case of Earth station.   2

PART – B   (50 Marks)

11. a) What is the principle of Radar ? Explain the operational details of Radar with block diagram.   5

    b) Derive the equation of range equation. Explain the parameters involved.   5

12. a) Explain the use of Doppler effect in Radar applications. Discuss the sub systems of Radar Altimeter and method to obtain range.   5

    b) How is range measured by CW Radar. What are CW Radar limitations ?   5

13. a) Differentiate between a tracking Radar and a surveillance Radar. Explain sequential lobe tracking Radar with a block diagram.   5

    b) Discuss the two types of Mono-pluse Radar. Explain the working principle of amplitude comparison Monopulse Radar.   5

14. a) Explain how is the location of a Satellite obtained with respect to Earth station in terms of azimuth and elevation.   5

    b) Give reasons for the change in orbit of a satellite. Discuss the effects of earth oblateness, inclination changes of sun, moon on the orbit.   5

15. a) Explain the design aspects of satellite links for specified C/N ratio.   6

    b) Discuss briefly about the satellite primary power systems. Explain the alternate methods to support power requirements due to solar eclipse.   4

16. a) Discuss the considerations and performance objectives of satellite link.   4

    b) Obtain the equation for link indicating losses in path. Assume the necessary requirements.   6

17. Short notes on **two** of the following :

    a) Staggered PRF in MTI radar   5

    b) Protocols used in Satellite communication.   5

    c) Satellite antenna.   5