

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II-Semester (Main) Examination, April / May 2013

Subject : Radar and Satellite Communication Systems**Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. Define radar cross section of target.
2. What is meant by maximum unambiguous range of radar? When the range is 1000 kms calculate the PRF required for the radar.
3. A MTI radar is operating at 10 GHZ with PRF of 1000 HZ. Calculate the lowest three blind speeds.
4. List the limitations of CW radar.
5. Explain about the role of duplexes in a radar system.
6. State Kepler's laws.
7. Why are different frequencies used on the uplink and the down link in satellite communication?
8. On what parameters of a system, does the carrier level depend in satellite telemetry.
9. What is meant by figure of merit of an earth station?
10. Name the four access methods used in satellite communications. Which is the most widely used?

PART – B (5x10=50 Marks)

- 11.(a) What are the losses in radar system and how to compensate them.
(b) Derive an expression for the maximum range of radar.
- 12.(a) With a neat block diagram, describe the operation of FM-CW radar.
(b) Distinguish between pulse Doppler radar and MTI radar.
- 13.(a) What do you understand by Doppler effect? Derive an expression for the relative velocity of a moving target.
(b) What is integration of radar pulses? Compare various integration techniques.
- 14.(a) What is duplexer?
(b) How does PPI Work? Explain in detail.
(c) Discuss radar antennas and their functions.
- 15.(a) Derive an expression for velocity of a space craft at its perigee and apogee in terms of semi major axis and eccentricity.
(b) What are different satellite orbits?
- 16.(a) Compare advantages and disadvantages of multiple access techniques.
(b) Compare HPAs and LNAs.
- 17.(a) Derive uplink design equation.
(b) Explain the terms Noise figure and Noise temperature.
