Code No. 6268 / O

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II-Semester (Old) Examination, April / May 2014

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 State the application of Radar. (3)
2 Define Radar cross section of the target. (2)
3 How does track-while-scan Radar operate? (2)
4 What is the requirement of threshold detection in Radar? (3)
5 What should be the pulse repetition frequency of a radar in order to achieve a maximum unambiguous range of 60 nmi? (2)
6 State Kepler's laws of orbital motion. (3)
7 Define the following with respect to a satellite (2)
(a) Perigee (b) Apogee
8 Why Telemetry, Tracking and Command control system are necessary for a satellite? (2)
9 Distinguish between multiplexing and multiple Access Techniques. Give examples. (3)
10 Compute the effective input noise temperature of a receiver whose noise figure is 10dB. (3)

PART – B (50 Marks)

11 Derive Radar range Equation in terms of Average Power, Number of pulses integrated, Noise figure and losses. (10)

12 (a) Draw the block schematic of an FM CW radar and explain the part played by each block. (6)
(b) Explain the constructional details of Delay lines. (4)

13 Explain the operation of a monopulse tracking radar. Explain in detail how the sum and difference signals are produced. (10)

14 (a) What are the different types of satellite orbits? Discuss their merits and demerits. (6)
(b) A satellite is orbiting in a geosynchronous orbit of radius 41500 km. Find the velocity and time of orbit. If g_o = 398600.5 Km^2/s^2. (4)

15 Compare the major differences, advantages, disadvantages and applications of different multiple access techniques used in satellite communication. (10)

16 (a) Explain how altitude and orbit control is achieved from an earth station. (6)
(b) Explain about redundancy configuration of power generation. How is it being Implemented? (4)

17 (a) Define system noise temperature and derive an expression for system noise temperature of a typical satellite transponder. (4)
(b) With relevant steps explain the design of satellite links for specified C/N. (6)

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Code No. 6528 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (New) (Main) Examination, April / May 2014

Subject : 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	What is unambignous range and how is it dependent on PRF?	2
2	What are the various types of system losses?	3
3	What is delay line canceller and where it is exactly used?	3
4	Lists the merits and demerits of CW radar.	2
5	State Keplers laws.	3
6	Mention the various types of Radar displays.	3
7	TDMA has all of the advantages over FDM/FM/FDMA give reasons.	2
8	What is meant by multiple access of satellite?	3
9	What is the significance of G/T ratio?	2
10	Name some satellite data communication protocols.	2

PART – B (50 Marks)

11	a)	Derive the expression for radar range equation.	6
	b)	Mention the applications of radar.	4
12	a)	With the block schematic explain FMCW radar.	7
	b)	Explain angle, range and Doppler glint.	3
13	a)	Draw the block diagram of conical scan tracking radar.	5
	b)	Why is amplitude comparison monopulse tracker more likely to be preferred over the phase comparison monopulse.	5
14	a)	Explain about various orbital effects in a communication system performance.	7
	b)	What are look angles? What is its significance?	3
15	a)	Explain the functions of statellite subsystems.	7
	b)	Write a note on spacecraft antennas.	3
16	a)	Explain in detail the steps involved in the design of satellite links for specified CNR.	7
	b)	Explain the significance of system noise temperature.	3
17	Write note on :		
	a)	Principles of CDMA	5
	b)	Noncoherent MTI radar	5

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