Reg. No. :

Question Paper Code: 49418

B.E./B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Electronics and Communication Engineering

14UEC918 - RADAR AND NAVIGATIONAL AIDS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

(Answer all Questions)

1.   The average power of radar is equal to   CO1- R

(a) P_t * PRF   (b) P_t * PRP

(c) P_t * duty cycle   (d) P_t /duty cycle

2.   An example of probability Density function is   CO1- R

(a) Gaussian   (b) Gamma   (c) kuroda   (d) Laplace

3.   The blind speed in radar are eliminated by   CO2- R

(a) Delay line cancellers   (b) Staggered PRF

(c) Doppler shift   (d) single PRF

4.   For Moving Target Indication (MTI) signal processing a   CO2- R

(a) Bessel filter is used   (b) Butterworth filter is used

(c) Elliptic filter is used   (d) Transversal filter is used

5.   The range resolution of pulse radar can be improved by   CO3- R

(a) increasing pulse width   (b decreasing pulse width

(c) increasing pulse amplitude   (d) decreasing pulse amplitude

6.

The method of scanning the sky without rotating or turning the antenna mechanically   CO3- R

(a) steering using log periodic array antennas   (b) steering using Binomial array antennas

(c) steered phased array antennas   (d) steering using parasitic array antennas

7.   Very high frequency Omni directional Range operates at   CO4- R

(a)108-136 MHz   (b) 108-136 KHz   (c) 108-136 GHz   (d) 108-136 THz

8.   Number of slave stations in DECCA chain is   CO4- R

(a) 1   (b) 2   (c) 3   (d) 4

9.   The abbreviation name TACAN is   CO5- R

(a) Tactical air navigation   (b) Tactical atmosphere navigation

(c) Troposphere air navigation   (d) Troposphere atmosphere navigation

10.   One of the component of Inertial Navigation system is   CO5- R

(a) goniometer   (b)microphone   (c)loud speaker   (d)Accelerometer

PART – B (5 x 2= 10Marks)

11.   Define maximum radar range & Write the simple radar range equation   CO1- R

12.   What is meant by staggered-prf-MTI   CO2- R

13.   Differentiate false alarm and missed detection.   CO3- R

14.   What are the errors possible in direction finders?   CO4- R

15.   Explain the method of transit system used in Satellite based navigation   CO5- R

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PART – C (5 x 16= 80Marks)

16. (a) Derive the simplified version of radar range equation in terms of minimum detectable signal to noise ratio$(S/N)_{min}$. Also explain why $(S/N)_{min.}$ is a better measure of a radous detection performance than in minimum detectable signal(S_{min}).   CO1- App   (16)

Or

(b) Explain how the system losses will affect on the Radar range   CO1- App   (16)

17. (a) i) With neat diagram explain the operation of conical scan tacking radar and explain its operation.   CO2- App   (8)

ii) What are the basic differences between a search radar and a tracking radar? Discuss the various scanning techniques and tracking mechanisms   CO2- App   (8)

Or

(b) Describe in detail about the conical scan and sequential lobing   CO2- U   (16)

18. (a) Explain in detail about Parabolic reflector antennas .Analyze f/D ratio of the same .   CO3- Ana   (16)

Or

(b) Discuss in detail about Linear Beam Power tube (klystron Amplifier).   CO3- U   (16)

19. (a) (i) Explain and analyse the principle of Loop antenna with suitable equations.   CO4- Ana   (10)

(ii) Explain in detail about VOR receiving equipment   CO4- U   (6)

Or

(b) Explain the process to measure range using Airborne Distance measurement equipment and also obtain the transmitter and receiver characteristics of Interrogator.   CO4- Ana   (16)

20. (a) Explain the different hyperbolic system of navigation in detail.   CO5- U   (16)

Or

(b) (i) Describe in detail an Instrument Landing system.   CO5- U   (10)

(ii) Briefly explain a ground controlled approach system.   CO5- U   (6)

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