Roll No. : ....

328744(28)

B. E. (Seventh Semester) Examination, Nov.-Dec. 2021

(New Scheme)

(Et&T Engg. Branch)

RADAR and NAVIGATIONAL AIDS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) of each question is compulsory and carries 2 marks. Part (b), (c) and (d) carry 7 marks. Attempt any two parts from (b) (c) and (d).

Unit-I

1. (a) State nominal frequency range of X and K band.

   (b) Derive the Radar range equation. Explain the factor

that affect the Radar range equation.

(c) A guided missile tracking radar has the following specifications. Transmitted power 400 kW, Pulse Repitition Frequency 1500 pps, Pulse width $0.8\,\mu s$.

Determine (i) Unambiguous range (ii) Duty cycle (iii) Average Power (iv) Suitable bandwidth of Radar.

(d) Describe briefly the behaviour of the Radar cross section (in microwave region) of a raindrop and a large aircraft with respect to its dependence on frequency.

Unit-II

2. (a) Define Blind speed.

(b) How Delay Line canceller works? Explain with help of example.

(c) With help of block diagram, explain principle of Conical Scan.

(d) What are the advantages of Simultaneous lobing over Lobe switching. And describe its principle.

Unit-III

3. (a) Define Evaporation Duct.

(b) Explain scattering from the round earth surface.

(c) Write short notes on Cosmic noise and Anthropogenic noise.

(d) Write short notes on following :

(i) Radar Siting

(ii) Faraday Rotation of Polarization

Unit-IV

4. (a) Define Directive Gain.

(b) What are the functions of Radar antenna. Explain principle of Cassergain feed antenna.

(c) Explain electronically steered phased array antenna with its advantages and disadvantages.

(d) Write short notes on Cosecant square antenna and Radome.

Unit-V

5. (a) What is the function of Duplexer in Radar Receiver.

   (b) With help of neat sketch, explain the working of Muticavity Klystron.

   (c) Write short notes on Radar Display (i) A scope (ii) PPI display (iii) RHI display

   (d) Find out the Receiver Noise Figure of N networks in cascade.