[05-4206]

IV/IV B.E. DEGREE EXAMINATION.

Second Semester

Electronics and Communication Engineering

RADAR ENGINEERING AND NAVIGATIONAL AIDS

(Effective from the admitted batch of 2006–2007)

Time : Three hours Maximum : 70 marks

Question No. 1 is Compulsory.

Answer any FOUR from the remaining.

All questions carry equal marks.

$(7 \times 2 = 14)$

1. (a) What are the applications of radar?

   (b) What is the radar range equation?

   (c) What is Doppler principle?

   (d) What are the applications of CW Doppler Radar?

   (e) What are the types of MTI Radar?

   (f) What is the difference between search Radar and tracking Radar?

   (g) Explain detection criteria in Radar signals.

2. (a) Draw the block diagram of the Radar and explain each block. (7)

(b) What is the maximum unambiguous range? How is it related with pulse repetition rate? (7)

3. (a) (i) Explain about the Radar Cross Section of target (RCS). (4)

(ii) Calculate the range of a target, if the time taken by the signal to travel and return is 100 micro seconds. (3)

(b) What is the difference between pulse interval and PRF? Explain. (7)

4. (a) Draw the block diagram FMCW radar and explain its operation. (7)

(b) What is the difference between a pulse radar and a pulse Doppler radar? (7)

5. (a) Derive the expression for Doppler frequency in terms of radar velocity and wave length. (7)

(b) What are the limitations of MTI radar? (7)

6. (a) Explain the following antenna tracking mechanisms.

(i) Sequential lobing

(ii) Conical scanning. (7)

(b) What are the various methods of acquisition before tracking a target wit radar? Explain in detail. (7)

7. (a) Explain about the ECM. (7)

(b) Briefly explain about the search radar system. (7)

8. (a) Define noise figure. Derive an expression for the noise figure of two networks, that are in cascade? (7)

(b) Explain about the Inland Shipping Aids? (7)
