R07

Code: R7410404

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain the various plumbing losses of radar.
   (b) By what factors is the PRF governed? Write the radar frequencies ranges and band.

2. (a) Derive the signal to noise ratio at receiver.
   (b) Explain the system losses in radar engineering.

3. (a) Explain the CW radar and block diagram of IF Doppler filter bank.
   (b) Explain multiple frequency CW radar.

4. (a) Explain sinusoidally modulated FM CW radar extracting the third harmonic.
   (b) Explain airborne doppler navigation.

5. (a) Explain block diagram of a simple digital MTI signal processor.
   (b) Explain moving target detector (MTD) signal processor.

6. (a) Explain amplitude comparison mono pulse radar.
   (b) Explain target reflection characteristics and angular accuracy.

7. (a) Calculate the maximum range of a radar system which operates at 3 cm with a peak pulse power of 500 KW, if its minimum receivable power is 10^{-13} W, the capture area of its antenna is 5 m^2 and the radar cross sectional area of the target is 20m^2.
   (b) Define a integration efficiency of radar pulses.
   (c) What is the false alarm number? How to calculate it?

8. Derive the impulse response of a matched filter that is commonly used in a radar receiver.

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