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Total number of printed pages – 2

B. Tech
PEEC 5303

Sixth Semester Examination – 2013

RADAR AND TV ENGINEERING

BRANCH : EC / ETC

QUESTION CODE : A259

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10
- What is radar cross section of target and what is its importance ?
 - Represent the luminance signal.
 - Find the number of radar pulses returned by a scanning radar with pulse repetition rate of 340 Hz, antenna beam width of 1.5° and scan rate of 30° per sec.
 - Why AM used for video and FM used for audio in TV system ?
 - What is composite video signal and how is it transmitted ?
 - What is maximum unambiguous range and how is it determined ?
 - A radar system transmits a peak pulse power of 400 kW with a pulse repetition rate of 1500 Hz and pulse width of $0.8 \mu\text{s}$. Calculate range in nmi and its average transmit power.
 - What is pedestal height ? What is its importance ?
 - What is flickering ? Is it good for TV broadcasting ? Justify.
 - What is missed detection ? Is it desired ?



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2. (a) What do you mean by false alarm ? How it can affect the radar system ? 4
- (b) Derive the expression for probability of false alarm and find the relation between false alarm time and IF bandwidth. 6
3. (a) Describe the horizontal and vertical resolution of monochrome TV system. 5
- (b) Discuss the rectangular scanning technique used in monochrome TV system and what are its limitations ? 5
4. Draw and explain the block diagram of PAL encoder and PAL decoder. Compare its performance with NTSC system. 10
5. (a) Differentiate between pulse Doppler radar, MTI radar and the FMCW radar. 5
- (b) Calculate the maximum range of radar system in nm which operate at 3 cm with a peak pulse power of 500 kW, its minimum receivable power is 10^{-13} W, the capture area of its antenna is 5 m^2 and target cross-section area is of 20 m^2 . 5
6. (a) What is the role of a delay line canceller ? Derive the frequency response of a single DLC. 6
- (b) How is it related to blind speed and how it can be avoided ? 4
7. (a) Explain the digital TV receiver system with suitable block diagram. 5
- (b) What is radar integration ? Distinguish the coherent and non coherent integration method. 5
8. Write short notes any **two** of the following : 5×2
- (a) Monopulse tracking radar
- (b) CCD
- (c) Cathode Ray Tube
- (d) Horizontal synchronizing pulses.