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Total number of printed pages – 2

B. Tech
PEEC 5303

Sixth Semester Regular Examination – 2014

RADAR AND TV ENGINEERING

BRANCH : EC, ETC

QUESTION CODE : F 299

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
- (a) Why MTI radar fails to detect fixed targets ?
 - (b) How do you differentiate between duplexer and diplexer ?
 - (c) Define Kell factor. What is its importance ?
 - (d) What is flicker effect and how it can be eliminated ?
 - (e) Differentiate A-Scope and PPI radar indicator.
 - (f) Define compatibility and reverse compatibility in TV system.
 - (g) Define chrominance signal.
 - (h) What is colour killer circuit ?
 - (i) A radar system transmits pulses of duration of $2 \mu\text{s}$ and pulse repetition rate of 1 kHz. Find the maximum and minimum range of radar.
 - (j) Differentiate MTI radar and Pulse Doppler radar.
2. (a) Discuss the scanning process in basic television system. 5
- (b) What is interlaced scanning ? Describe its advantages over simple scanning. 5

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3. (a) What is Doppler Effect ? Derive the formula for Doppler shift. 5
 (b) Explain the working of FMCW radar with the help of necessary diagrams. 5
4. Describe the role of delay line canceller in MTI radar. Comment on disadvantages of MTI radar and how it can be overcome ? 10
5. (a) Show how changing PRF can detect the ambiguous range ? 5
 (b) Justify the role of pre- and post-equalizing pulses. Why is it necessary to keep their duration equal to the half-line period ? 5
6. A radar is operates with a frequency of 3 kHz radiating power of 200 kW having 20 cm² radar cross-section. The area of radar antenna is 9 m² and aperture efficiency of 30%. Calculate range to the target in nmi, if the received signal obtained have bandwidth of 5 kHz, noise figure of 2 dB and minimum signal to noise ratio of 100 dB. 10
 Given : $k = 1.38 \times 10^{-23} \text{ J/}^\circ\text{K}$.
7. (a) What is aspect ratio and why is it maintained at 4 : 3 ? 2+6
 (b) Describe the additive and subtractive colour mixing method used in colour TV system. 2
8. Write short notes on any **two** of the following : 5×2
 (a) Vidicon camera tube
 (b) NTSC system
 (c) Doppler Filter banks
 (d) LCDs.

