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Total number of printed pages – 2

B. Tech
PEEC 5303 (New)

Sixth Semester (Back) Examination – 2013

RADAR AND TV ENGINEERING

BRANCH : EC, ETC

QUESTION CODE : B312

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
- Why MTI radar fails to detect fixed targets ?
 - How do you differentiate between duplexer and diplexer ?
 - Define Kell factor. What is its importance ?
 - What is flicker effect and how it can be eliminated ?
 - Differentiate A-Scope and PPI radar indicator.
 - Define compatibility and reverse compatibility in TV system.
 - Define chrominance signal.
 - What is colour killer circuit ?
 - 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.
 - 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
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

P.T.O.

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. Given : $k = 1.38 \times 10^{-23} \text{ J/K}$ 10
7. (a) What is aspect ratio and why it is 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.

