

Registration No. :

--	--	--	--	--	--	--	--	--	--

Total number of printed pages – 3

**B. Tech**  
**PEEC 5303**

**Sixth Semester Back Examination – 2015**

**RADAR AND TV ENGINEERING**

**BRANCH(S) : EC, ETC**

**QUESTION CODE : M 373**

**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) What is raster ?
- (b) Why flicker is not removed by progressive scanning ?
- (c) Why do blind speeds occur ? What is the radial velocity that produces blind speed ?
- (d) What do you mean by tracking radar ?
- (e) Why scanning is necessary for television system ?
- (f) Which principles are used in optical electrical conversions ? Give example.
- (g) What is the main function of the blanking pulses ?
- (h) What are the three systems of colour television and which system used in India ?
- (i) A radar system transmits pulses of duration of  $4 \mu\text{s}$  and pulse repetition rate of 2 kHz. Find the maximum and minimum range of radar.
- (j) Differentiate between MTI radar and Pulse Doppler radar.

**P.T.O.**

2. (a) Explain the interlaced scanning technique. Describe its advantages over simple scanning. 5
- (b) Calculate the bandwidth required for video signal formed by scanning system with 525 lines per picture frame and 25 picture frames per second. 5
3. (a) A radar is operates with a frequency of 3 kHz radiating power of 400 kW having  $10 \text{ cm}^2$  radar cross section. The area of radar antenna is  $9 \text{ m}^2$  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. 5
- Given :  $k = 1.38 \times 10^{-23} \text{ J/}^\circ\text{K}$
- (b) Explain different system losses occurred in radar system. 5
4. (a) How detection of signal is done in the presence of noise in radar system ? 5
- (b) Explain the operation of moving target indicator radar with the help of suitable block diagram. 5
5. What do you mean by false alarm ? Derive the equation for false alarm time. 10
- $$T_{fa} = \frac{1}{B} \exp\left(\frac{V_T^2}{2\phi_0}\right)$$
6. (a) With the help of neat diagram, explain the amplitude comparison monopulse radar. 5
- (b) What is Doppler shift ? An MTI radar indicates Doppler shift of an automobile as 1 kHz. The radar operates at a frequency of 10 GHz with PRF of 1 kHz. Find the speed of the automobile. 5
7. (a) What is the role of a delay line canceller (DLC) ? Find out the frequency response of a single delay line canceller. 5
- (b) Describe the additive and subtractive colour mixing method used in colour TV system. 5

8. Write short notes on any two :

5×2

- (a) Vidicon camera tube
- (b) Digital TV Receiver
- (c) PAL System
- (d) Composite video signal.

