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Total Number of Pages: 02

Course: B.Tech
Sub_Code: REC7D006

7th Semester Regular/Back Examination: 2024-25

SUBJECT: Radar and TV Engineering

BRANCH(S): ECE, ETC

Time: 3 Hours

Max Marks: 100

Q.Code: R206

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right-hand margin indicate marks.

Part-I

Q1 Answer the following questions: (2 x 10)

- Which parameters are to be changed to enhance the ranging capability of pulsed radar?
- Which radar can measure both range and velocity of a moving target?
- State the basic distinguishing factors between MTI and pulsed Doppler radar.
- Explain false alarm in context with a radar receiver.
- What do you mean by scanning in Television system?
- How G-Y signal can be generated from R-Y, B-Y, and Y signals?
- Draw colour circle diagram for primary colours used in TV transmission.
- What are basic blocks of MPE4?
- What do you mean by digital TV over IP?
- What is the principle of LCD display technology used in TV?

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Which scanning system is used in television system and why?
- With neat diagram explain the working of a broadcast TV transmitter.
- Explain the operational principle of colour TV camera pick-up tube.
- Mention the applications of Duplexer and Dipleplexer.
- Which radar detects the direction of radial velocity of a target and how?
- Why simply radar range equations do not adequately predict the range performance of actual radar?
- What modifications are to be carried out in CW radar to measure range and how?
- Briefly explain instrument landing system (ILS) and ground control approach (GCA) system.

- i) Explain any two digitization formats to digitize an analog signal of bandwidth F_{\max} .
- j) Write down principle of JPEG decoding.
- k) Which modulation scheme is used for Terrestrial digital TV. Explain its working principle.
- l) Explain briefly plasma video display technology.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3** Draw the block diagram of side band super heterodyne CW radar. Why the super heterodyne principle adopted here? Does such radar suffer from blind speeds? Describe a scheme to determine the sign of the radial velocity of the target for this radar if IF filter bank is not used. **(16)**
- Q4** Determine the radar range equation in terms of radar peak power transmitted, the antenna parameter, cross section of the target, operating temperature, and receiver bandwidth, noise figure and minimum output SNR required based on single pulse detection. **(16)**
- Q5** With neat sketch explain the different signals of Composite Colour Video Signal (CCVS). **(16)**
- Q6** State the evolution of different display technologies found in digital TV till date. **(16)**