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**B. Tech 7th Semester Examination**

**TV Engineering (OS)**

**EC-7001**

**Time : 3 Hours**

**Max. Marks : 100**

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

- Note :** (i) Attempt five questions, selecting one from each of the sections A, B, C, D and all the subparts of section E.  
(ii) All parts of a question should be answered at one place.  
(iii) Answers should be brief and to the point and be supplemented with neat sketches.

**SECTION - A**

1. (a) How many horizontal lines get traced during each vertical retrace? What is the active number of lines that are actually used for picture information pick up and reception? (10)  
(b) How is the illusion of continuity created in television pictures? Why has the frame reception rate been chosen to be 25 and not 24 as in motion pictures? (10)
2. (a) Sketch composite video signal waveform for at least three successive lines and indicate : (i) extreme white level, (ii) blanking level, (iii) pedestal height and (iv) sync pulse level. Justify the choice of P/S ratio = 10/4 in the composite signal. Why the combining of picture signal and sync pulses is called a voltage division multiplex? (10)

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- (b) Draw and explain block diagram of TV receiver and transmitter. (10)

**SECTION - B**

3. (a) What is the function of aquadag coating on the inner side of the tube bell? Why is a grounded coating provided on the outer surface of the picture tube? (10)  
(b) What is the basic principle of a camera pick-up tube? Describe the two photoelectric effects used for converting variations of light intensity into electrical signals. (10)
4. (a) Draw a block diagram to show how the video signal is modulated and processed at the picture transmitter. Why is high level modulation not used in a TV transmitter? (10)  
(b) How is frequency modulation produced? Draw the circuit of a basic reactance modulator and prove that its output reactance varies with changes in the amplitude of the drive voltage. (10)

**SECTION - C**

5. What do you understand by image rejection ratio? Explain how by providing an RP amplifier, image signal reception is greatly minimized. What are the other merits of using an RF amplifier before the frequency converter? (20)
6. Discuss the merits of electromagnetic deflection over electrostatic deflection in television picture tubes. With suitable analysis explain why 'cosine winding' is used for deflection coils? (20)

**SECTION - D**

7. (a) Draw and explain the basic principle involved in construction and working of delta gun color picture tube. (10)

(b) Draw and explain detailed block diagram of digital TV and also mention its merits of DVB over conventional one. (10)

8. Why are the modulated sub-carrier vectors shifted by  $33^\circ$  to constitute Q and I signal in the NTSC system? Why different bandwidths are assigned to Q and I signals? (20)

### SECTION - E

9. (a) List the contents of a composite video signal.  
(b) Define image rejection ratio.  
(c) What do you understand by flicker?  
(d) What are Sync pulses?  
(e) What do you mean by saturation?  
(f) Mention some features of PAL system.  
(g) What is Forward AGC control?  
(h) List four merits of digital TV receivers.  
(i) Write merits of Vidicon.  
(j) Mention pitfalls of image orthicon. (2×10=20)