

**DiplETE – ET (Current Scheme)**

Time: 3 Hours

**JUNE 2016**

Max. Marks: 100

**PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.**

**NOTE: There are 9 Questions in all.**

- Question 1 is compulsory and carries 20 marks. Answer to Q. 1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

**Q.1 Choose the correct or the best alternative in the following: (2×10)**

- a. Bandwidth of video baseband signal in India is \_\_\_\_\_  
 (A) 4.5 MHz (B) 5 MHz  
 (C) 5.5 MHz (D) 6 MHz
- b. Video signals below 10% of the carrier are known as \_\_\_\_\_  
 (A) Blacker than black (B) black  
 (C) White (D) whiter than white
- c. Horizontal trace in scanning takes \_\_\_\_\_ microseconds in India  
 (A) 52 (B) 60  
 (C) 63.5 (D) 64
- d. Width of V-sync pulse is \_\_\_\_\_microsecond while that of H-sync pulse is \_\_\_\_\_ microsecond  
 (A) 160 and 4.7 (B) 160 and 64  
 (C) 4.7 and 160 (D) 64 and 160
- e. The signal essential to the operation of a black and white TV is \_\_\_\_\_  
 (A) Chrominance signal (B) Luminance signal  
 (C) Composite video signal (D) control signal
- f. In the NTSC system, the two colour difference signals are \_\_\_\_\_  
 (A) Transmitted together (B) not transmitted together  
 (C) Transmitted in quadrature (D) Transmitted in anti-phase
- g. \_\_\_\_\_ is not required in TV Receivers  
 (A) Bass control (B) Volume control  
 (C) Brightness control (D) White balance
- h. Sound system uses \_\_\_\_\_ in PAL transmitter  
 (A) AM (B) FM  
 (C) AMSC (D) AMVSB
- i. Reference phase of the sub carrier in NTSC is \_\_\_\_\_clockwise from  $-(B-Y)$   
 (A)  $0^\circ$  (B)  $45^\circ$   
 (C)  $57^\circ$  (D)  $90^\circ$

- j. Colour burst is used to \_\_\_\_\_  
(A) boom intensity of colours in the picture tube  
(B) dilute the vivid colours  
(C) synchronize generation of sub-carrier in the receiver  
(D) ensure the correct modulation of colours in colour encoder

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**Answer any FIVE Questions out of EIGHT Questions.**  
**Each question carries 16 marks.**

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- Q.2** a. Give detailed specifications of CCIR-B standards in respect to video characteristics, composite video signal characteristics and radio frequency characteristics. (8)  
b. Calculate the interval between slots in V-sync pulse, if the slots are of  $4.7\mu\text{s}$  width and there are 5 serrations in the V-sync pulse of  $160\mu\text{s}$  duration. (8)
- Q.3** a. Explain the working of precision in line picture tube. Discuss its merits over delta gun picture tube. (8)  
b. Discuss the relative merits of magnetic deflection over electrostatic deflection. (8)
- Q.4** a. Give Reasons for the following  
(i) Vertical sync pulse is serrated.  
(ii) Pre and Post equalizing pulses are added in the composite video signal. (8)  
b. What is interlaced scanning? How it is done? What are its merits over simple (progressive) scanning? (8)
- Q.5** a. Explain additive colour mixing and subtracting colour mixing in detail. (8)  
b. With the help of a block diagram, explain the encoder and decoder of the PAL-D system. (8)
- Q.6** a. Explain the concept of colour resolution and bandwidth of colour signals. (7)  
b. Describe with the diagram the principle operation of the colour TV signals, with reference to (i) interleaving of colour signals (ii) location of colour burst (9)
- Q.7** a. Discuss how the EIA test pattern can be used in measurement of linearity, contrast and resolution? (8)  
b. Explain how window signal can be used for testing overshoot, ringing, streaking and smear? (8)
- Q.8** a. Draw the block diagram of colour TV receiver. How signal is processed in each block? (8)  
b. Explain the function of colour killer, colour subcarrier and colour burst separator in reference to colour TV receivers. (8)
- Q.9** a. Enumerate safety precautions which must be observed while servicing a television receiver. (8)  
b. If the reflected wave reaches the antenna after a delay of 0.4 microsec with respect to the direct wave, determine the displacement of ghost image in mm for 50 cm screen. (8)