Code: D-18 Subject: TELEVISION ENGINEERING
Time: 3 Hours Max. Marks: 100

NOTE: There are 11 Questions in all.

Question 1 is compulsory and carries 16 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.
Answer any THREE Questions each from Part I and Part II. Each of these questions carries 14 marks.
Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or best alternative in the following: (2x8)

a. Interlaced scanning eliminates
(A) radio interference. **(B)** vertical rolling.
(C) dullness. **(D)** flicker.

b. Weak emission from the picture tube cathode can cause,

(A) dark picture. **(B)** low contrast.
(C) silvery gray picture. **(D)** none of these.

c. If the aspect ratio is 4 : 3 in a conventional T.V. system, what would be the width and height in cms for a 100 cm screen
(A) 80, 60. **(B)** 87, 49.
(C) 60, 45. **(D)** 30, 40.

d. Antimony trisulphide is used as a photo sensitive material in the camera tube of

(A) Vidicon. **(B)** Plumbicon.
(C) Image orthicon. **(D)** None of these.

e. Colour sub carrier frequency in PAL system is
(A) 4.43 MHz. **(B)** 3.58 MHz.
(C) 38.9 MHz. **(D)** 5.5 MHz.

f. Frequency modulation of colour difference signals is used in

(A) NTSC system. **(B)** PAL system.
(C) SECAM system. **(D)** None of these.

g. The sound 1F in colour T.V. receiver is

(A) 5.5 MHz. **(B)** 38.9 MHz.
(C) 33.4 MHz. **(D)** 4.43 MHz.

h. If the picture is rolling the fault may be due to

(A) absence of vertical sync. **(B)** horizontal sync failure.
(C) fault in AGC. **(D)** fault in IF section.

PART I
Answer any THREE Questions. Each question carries 14 marks.

Q.2 a. Explain
(i) aspect ratio. (ii) kell factor. **(6)**

b. A T.V. system has the following standards
Lines per frame : 525
Frame frequency : 30 Hz
Interlace ratio : 2 : 1
Horizontal retrace time : 10.2 μs
Vertical retrace time : 1300 μs
Kell factor : 0.7
Aspect ratio : 4 : 3
Calculate the maximum bandwidth of the system. **(8)**

Q.3 a. Describe the working principle of the Plumbicon T.V. camera. **(8)**

b. Explain the use of the following in a T.V. camera
(i) Zoom lens. (ii) Dichroic block. **(6)**

Q.4 a. Explain the operation of a monochrome T.V. transmitter with a neat diagram. **(8)**

b. Explain
(i) positive and negative modulation.
(ii) why negative modulation is preferred. **(6)**

Q.5 a. Sketch the 625 line CCIR-B monochrome and compatible PAL colour channel bandwidth details showing location of y, c and sound carrier frequencies. Also show the bandwidth of the chroma signals, sound signals and the guard band. **(8)**

b. Explain the following :-
(i) adjacent channel interference.
(ii) ghost interference. **(6)**

Q.6 a. Sketch composite video signal wave form, employing negative modulation, for successive three lines

showing
(i) extreme white level (ii) blanking level
(iii) pedestal height (iv) sync pulse level. **(8)**
b. Explain the need of blanking & syn pulses in T.V. system. **(6)**

PART II
Answer any THREE Questions. Each question carries 14 marks.

Q.7 a. Explain why it is suitable to use colour difference signals (R Y) and (B Y) for colour T.V. transmission why is (G Y) not used. **(8)**

b. Explain compatibility and how the transmission of (R Y) and (B Y) colour difference signals helps in maintaining it. **(6)**

Q.8 a. Give the constructional details of PIL colour picture tube. **(8)**

b. Explain
(i) pin cushion distortion.
(ii) function of purity magnets. **(6)**

Q.9 a. Explain the difference between PAL and SECAM T.V. systems. **(7)**

b. Give briefly the merits and demerits of the above two T.V. systems. **(7)**

Q.10 Discuss briefly the alignment procedure for the following sections of a colour T.V. receiver.
(i) Tuner section. (ii) IF section. **(14)**

Q.11 Write short notes on any **TWO** of the following:

(i) Yagi antenna.
(ii) Automatic Frequency Control (AFC).
(iii) Colour Killer circuit. **(7 x 2)**