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. What will be the number of scanning lines if the ratio of the height of the T.V. screen and the distance of viewer is $\frac{1}{6}$

(A) 600. **(B)** 400.
(C) 500. **(D)** 300.

b. Gamma correction is applied by the circuit

(A) in the video camera chain. **(B)** in the picture tube.
(C) in VIF section of T.V. receiver. **(D)** in the SIF section of T.V. receiver.

c. Yellow colour is a combination of

(A) Red and Green. **(B)** Red and Blue.
(C) Blue and Green. **(D)** None of these.

d. Y component in cyan colour is

(A) 0.7. **(B)** 0.11.
(C) 0.59. **(D)** 0.3.

e. In PAL system phase of (R-Y) is changed every alternate line by

(A) 90°. **(B)** 180°.
(C) 270°. **(D)** 360°.

f. Most commonly used antenna for television reception is

(A) yagiuda. **(B)** turnstile.
(C) dipole. **(D)** rhombic.

g. Which stage of the colour receiver incorporates the contrast control

(A) chroma amplifier. **(B)** video detector.
(C) video amplifier. **(D)** phase discriminator.

h. Dark current in a camera tube is in

(A) pico amperes. **(B)** milli amperes.
(C) nano amperes. **(D)** micro amperes.

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

Q.2 a. What is meant by active and blanking periods in horizontal and vertical scanning? What are the nominal active and retrace intervals of horizontal and vertical scanning, horizontal sync pulse, front porch and back porch in the 625 line CCIR-B system. **(6)**

b. The specifications of a closed circuit T.V. system are as follows:

No of lines	= 250
Interlace ratio	= 1 : 1
Frame rate	= 50 / sec
Aspect ratio	= 4 : 3
Vertical retrace time	= 10% of the picture frame time
Horizontal retrace time	= 20% of link scan time
Kell factor	= .75

Calculate the maximum modulating frequency generated by the system. **(8)**

Q.3 a. Draw the block diagram of monochrome T.V. receiver and state the function of each block. **(7)**

b. Give the advantages of AGC in a T.V. receiver. Give block diagram of a typical AGC circuit. **(7)**

Q.4 a. Show by a simple block diagram how Y signal and colour difference signals (R-Y) and (B-Y) are developed from camera output for transmission. **(6)**

b. Explain by drawing a block diagram how colour difference signals (R-Y) and (B-Y) are encoded to obtain chrominance signal. Calculate the magnitude of Magenta colour. **(8)**

Q.5 a. Give a simplified block diagram of PAL-D colour decoder. **(8)**

b. Explain through a block diagram how U and V colour phasors are separated. **(6)**

Q.6 a. Explain why F.M. is used for sound signal transmission in T.V. Explain pre-emphasis & de-emphasis in FM. **(8)**

b. Describe a basic circuit of an FM modulator using varactor diode. **(6)**

PART II

Answer any THREE Questions. Each question carries 14 marks.

Q.7 a. Describe Trintron Cathode-in-line picture tube. **(7)**

b. Explain degaussing and automatic degaussing. **(7)**

Q.8 a. Explain why T.V. transmission is done at carrier frequencies above 40 MHz. Explain why space wave propagation is the only effective mode of propagation for T.V. signals. **(8)**

b. What is adjacent channel interference and how it is eliminated? **(6)**

Q.9 a. Describe how vidicon camera develops video signals. Explain any draw backs of the camera. **(8)**

b. Explain the following :-

(i) stop number

(ii) Automatic Bean Control. **(6)**

Q.10 a. Give the signal flow diagram for servicing a monochrome T.V. receiver with the following faults,

Raster present but no picture and no sound. **(8)**

b. Explain the functions of the following in a colour T.V. receiver

(i) Colour killer circuit.

(ii) Chroma band pass amplifier. **(6)**

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

(i) Colour burst signal.

(ii) Weighting correction.

(iii) Turnstile array.

(iv) NTSC T.V. System. **(7 x 2)**