ROLL NO. _____

Code: DE68 **Subject: TELEVISION ENGINEERING**

DipIETE – ET

Time: 3 Hours **DECEMBER 2014** **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. About I and Q terms used in NTSC, Q stands for

(A) Quality **(B)** Quadrature
(C) Quantum **(D)** Quantity

b. Colour burst is used to

(A) Boom intensity of colours in the picture tube
(B) Dilute the vivid colours
(C) Synchronize generation of subcarrier in the receiver
(D) Ensure the correct modulation of colours in colour encoder

c. Aspect ratio for width to height for a traditional TV picture frame is

(A) 1:1 **(B)** 2:1
(C) 4:3 **(D)** 5:4

d. The number of interruptions in projecting movie pictures on a cinema screen are

(A) 24 **(B)** 48
(C) 50 **(D)** 60

e. The spectral response of _____camera tube resembles best the response of the eye

(A) Image orthicon **(B)** Vidicon
(C) Plumbicon **(D)** Chelnicon

f. The purpose of hold-down circuit in the picture tube is to limit the amount of

(A) high voltage **(B)** low voltage
(C) brightness **(D)** contrast

g. H-sync pulse is separated from V-sync pulse by employing __ circuit

(A) Differentiator **(B)** Multiplier
(C) Subtractor **(D)** AFC

h. The colour subcarrier frequency in NTSC TV system is

(A) 4.43 MHz **(B)** 4.38 MHz
(C) 3.58 MHz **(D)** 3.43 MHz

i. Bandwidth of colour signals is about ____while that of the luminance signal is about _____

(A) 1.5 MHz, 5 MHz **(B)** 7.5 MHz, 5.5 MHz
(C) 5 MHz, 1.5 MHz **(D)** 5.5 MHz, 7.5 MHz

j. Vestigial type modulation gives

(A) Low bandwidth **(B)** High SNR
(C) FM **(D)** Wide bandwidth

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

Q.2 a. Write down the factors on which the bandwidth of video signals depends. **(4)**

b. What type of polarity of video signal is needed at the picture tube and how is it achieved? **(4)**

c. Calculate the frequency band covered by TV video signal considering: aspect ratio=4/3, scanning =25 pictures/sec, number of liners per frame=625. **(8)**

Q.3 a. Compare magnetic and electrostatic deflection of beam. **(8)**

b. How focusing of electron beam is achieved in TV picture tube? Discuss the factors affecting picture contrast and brightness. **(8)**

Q.4 a. How the interlaced scanning reduces flicker and conserve bandwidth? **(8)**

b. Draw and explain the composite video signal of negative polarity for a horizontal line, showing H-blanking pulse, H-sync pulse, colour burst signals and variable video signal. **(8)**

Q.5 a. How does colorplexed video signal indicate hue, saturation and luminance of the picture information? **(8)**

b. Explain how the 'Y' and color difference signals are developed from the camera outputs? Why is the 'Y' signal set = 0.3R + 0.59G – 0.11B? **(8)**

Q.6 a. Justify the choice of 3.579545MHz as the sub carrier frequency in the NTSC system. How does it affect the line and field frequencies? **(8)**

b. Explain with the block diagram how both (B-Y) and (R-Y) signals are combined around the same sub carrier frequency by Quadrature modulation? Why is the color signal bandwidth requirement much less than those of Y signal? **(8)**

Q.7 a. Explain the EIA Standard for Color-Bar Signal. **(8)**

b. Explain stair-step test signals. **(8)**

Q.8 a. Draw the block diagram of colour TV receiver and explain the function of each block in brief. **(8)**

b. Draw the block diagram of sound carrier in TV receiver. Explain briefly, how the intercarrier sound signals as obtained at video detector is processed to produce sound output? Why is a de-emphasis circuit rs provided after FM detector? **(8)**

Q.9 Write short notes on the following:- **(8+8)**

(i) The use of oscilloscope in TV servicing
(ii) Three Steps to Effective Trouble Shooting