

**Code: D-18****Subject: TELEVISION ENGINEERING****December 2005****Time: 3 Hours****Max. Marks: 100****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.**
  - **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 best alternative in the following: (2x10)**

- a. The horizontal resolution in lines of a typical low-cost US monochrome receiver having a video bandwidth of 3 MHz is
- (A) 200 lines. (B) 240 lines.  
(C) 100 lines. (D) 150 lines.
- b. In monochrome receivers, at the final anode of the picture tube
- (A) 10 to 11 KV EHT supply is required.  
(B) No EHT supply is required.  
(C) 20 to 25 KV EHT supply is required.  
(D) 1 to 10 KV EHT supply is required.
- c. The exact value of the color sub carrier frequency chosen in the PAL system is
- (A) 4.4382157 MHz (B) 4.4339789 MHz  
(C) 4.43361875 MHz. (D) 4.43387958 MHz
- d. To produce a good quality picture, the peak signal-to-r.m.s. noise ratio that is generally considered adequate is around
- (A) 10 dB. (B) 70 dB.  
(C) 45 dB. (D) 100 dB.
- e. The RF carrier power output of commonly used VHF TV transmitters varies from
- (A) 4 to 8 KW (B) 100 to 150 KW  
(C) 10 to 50 KW (D) 2 to 8 MW

- f. While designing any Yagi antenna array for calculating the spanning between the reflector and dipole in meter, as a starting point, the formula used is

$$(A) \approx \frac{140}{f}$$

$$(B) \approx \frac{40}{f}$$

$$(C) \approx \frac{75}{f}$$

$$(D) \approx \frac{55}{f}$$

Where 'f' is the centre frequency of the channel in MHz.

- g. The pattern of scanning lines in a video system is called

(A) Retrace.

(B) Resolution.

(C) Raster.

(D) Interlace.

- h. The most used picture tube in present day colour TV receivers is the

(A) Delta-gun tube.

(B) PIL tube.

(C) Image orthicon tube.

(D) Plumbicon.

- i. The PAL system was developed in

(A) Japan.

(B) USA.

(C) South Africa.

(D) The Federal Republic of Germany.

- j. The bandwidth allowed for the colour difference quadrature signals after modulation is about

(A) 0.99 MHz.

(B) 2 MHz.

(C) 1.3 MHz.

(D) 0.6 MHz.

---

**Answer any FIVE Questions out of EIGHT Questions.**

**Each question carries 16 marks.**

---

**Q.2** a. Explain the principle of interlaced scanning with an illustration. **(8)**

- b. Briefly describe the following:

(i) the effect of interlaced scanning on bandwidth.

(ii) The effect of field frequency on bandwidth. **(8)**

- Q.3** a. List the characteristics to be possessed by a camera tube in order to be called the eye of a TV system. Explain briefly the term 'VIEWING DISTANCE' as applied to a TV camera. **(6)**
- b. Name the two cameras which are variations of the standard vidicon and briefly explain each one of them. **(10)**
- Q.4** a. With a neat sketch, illustrate the field synchronising pulse trains of the 625 line TV system at the end of the first field. What is the purpose served by
- (i) serrating the vertical sync pulses?
- (ii) Providing pre and post equalising pulses? **(10)**
- b. For the 525 line system, calculate the percentage (total) of the signal time that is occupied by
- (i) horizontal blanking (ii) vertical blanking
- (iii) active video. **(6)**
- Q.5** a. Distinguish between a monochrome picture tube and a colour picture tube. **(4)**
- b. With a neat sketch explain the elements of a monochrome picture tube employing low voltage electrostatic focussing and magnetic deflection. **(12)**
- Q.6** a. What type of colour mixing is employed in colour television? Explain the principle involved in the technique used. State Grassman's Law. **(7)**
- b. What are the characteristics to be possessed by any colour to specify its visual information? An RGB video signal has normalised values of  $R=0.2$ ,  $G=0.4$  and  $B=0.8$ . Find values of the luminance signal, the in-phase component of colour signal and the quadrature component of the colour signal. **(9)**
- Q.7** a. What do you mean by positive modulation and negative modulation? Make a comparison of the above techniques on the following aspects:
- (i) effect of noise interference on picture signal.
- (ii) Peak power available from transmitter. **(13)**
- b. In the colour system, why is the sub carrier frequency is chosen to be an odd multiple of one-half the horizontal frequency? **(3)**
- Q.8** a. With necessary illustrations explain how an FET can be used as a horizontal sync separator. **(11)**
- b. What is the function of the Chroma bandpass amplifier? Name the parts of this amplifier. **(5)**

- Q.9** a. What is a colour bar pattern generator? What are the checks to be carried out to align a new monochrome TV set before proceeding with the alignment of RF and IF sections of the receiver? Indicate the sequence to be followed to carry out receiver alignment.  
(9)
- b. What is the use of remote control facility? With a schematic, explain a basic remote control system.  
(7)