21819

3 Hours / 100 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :   (1)   All Questions are *compulsory.*

(2)   Answer each next main Question on a new page.

(3)   Illustrate your answers with neat sketches wherever necessary.

(4)   Assume suitable data, if necessary.

(5)   Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1.   **(A)   Attempt any SIX :**   **12**

(a)   What is Noise ? List different types of Noise.

(b)   Represent AM and FM in frequency domain.

(c)   Why does the atmosphere absorb some power from waves propagating through it ? At what frequencies does this absorption becomes apparent ?

(d)   Illustrate the main difference between resonant and non-resonant antenna.

(e)   Explain how the use of an RF amplifier improves the signal to noise ratio of a super heterodyne receiver.

(f)   Justify the choice of a rectangular frame width to height ratio equal to 4 : 3 of TV.

(g)   Compare vidiocon and plumbicon tubes w.r.t. principle and advantage.

(h)   Why is audio not transmitted generally in CCTV systems ?

(B) **Attempt any TWO :**   8

    (a)   Define Modulation. List advantages of Modulation. (any three)

    (b)   A broadcast AM transmitter radiates 50 kW of carrier power. What will be the total radiated power at 85% modulation and also, calculate power in each side band.

    (c)   What is pre-emphasis and de-emphasis ? Draw its circuits.

2. **Attempt any FOUR :**   16

    (a)   Calculate the percentage power saving if only one side band is transmitted at 80% modulation.

    (b)   Describe FM generation using varactor diode.

    (c)   What determines the bandwidth used by any given FM communications system ? Why are two different types of bandwidth used in frequency modulated transmissions ?

    (d)   Draw the block diagram of electronics communication system. State function of each.

    (e)   Describe ground wave propagation. How does it affect field strength at a distance from the transmitter ?

    (f)   Define :

        (i)   Critical frequency   (ii)   Skip distance

        (iii) Fading   (iv)   Maximum usable frequency

3. **Attempt any FOUR :**   16

    (a)   Describe generation of PWM using IC 555.

    (b)   Describe the strata of the ionosphere and their effects on sky-wave propagation.

    (c)   Draw the structure, radiation pattern and two applications of horn antenna.

    (d)   Draw the structure of folded dipole antenna with its radiation pattern.

(e) Define :

    (i) Polarization

    (ii) Beam width

    (iii) Directivity

    (iv) Antenna gain

(f) Draw the structure, radiation pattern and two applications of rectangular micro strip antennas.

4. **Attempt any FOUR :** **16**

(a) Draw the circuit diagram of practical diode detector. How is AGC obtained from this detector ?

(b) Define :

    (i) Sensitivity

    (ii) Selectivity

    (iii) Fidelity

    (iv) Image frequency

(c) Draw the block diagram of FM super heterodyne radio receiver. State the function of limiter.

(d) With circuits explain, how and for what reason, the ratio detector is derived from the phase discriminator.

(e) Describe the general purpose of frequency changing in a superheterodyne receiver. What are some of the devices that can be used as frequency changes ?

(f) Define :

    (i) Brightness

    (ii) Luminance

    (iii) Hue

    (iv) Saturation

5. **Attempt any FOUR :** 16

    (a) Illustrate the factors influencing the choice of the intermediate frequency for a radio receiver.

    (b) Describe the block diagram of PLL based FM detector.

    (c) What do you understand by scanning ? Why is it needed ?

    (d) Draw CVS at the end of odd field as well as at the end of even field. Show width of various sections of V-blanking pulse.

    (e) Compare additive mixing and subtractive mixing with examples.

    (f) State any eight CCIR B standards for colour signal transmission and reception.

6. **Attempt any FOUR :** 16

    (a) Draw the CVS of negative polarity for a horizontal line showing H-blanking pulse, H-sync pulse, colour burst signal and variable video signal.

    (b) Describe the working of a solid state camera tube using charge coupled device.

    (c) Draw the block diagram showing basic elements of a typical CA TV system.

    (d) Draw the block diagram of PAL-D decoder.

    (e) Describe the working of precision-in-line picture tube.

    (f) Draw the block diagram of colour TV transmitter. State function of PAL-D encoder.

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