11718

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) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. **(A) Attempt any SIX of the following :**   **12**
    (a) Draw basic block diagram of electronic communication system.
    (b) Define Maximum deviation ratio of FM.
    (c) Why EM waves are said to be transverse waves ?
    (d) Define polarization of an antenna & state it's types.
    (e) A superheterodyne radio receiver with an IF is 455 kHz is tuned to a station operating at 1600 kHz. Calculate image frequency.
    (f) Define aspect ratio & why TV width is greater than height ?
    (g) Compare vidicon and plumbicon camera tubes. (any two points)
    (h) State the application of CCTV.

    (B) Attempt any TWO of the following :   **8**
    (a) Define modulation & explain need of modulation.
    (b) Derive expression for power in AM and prove that Pt = 1.5 Pc for AM wave, when m = 1.
    (c) Describe the concept of pre-emphasis and de-emphasis with the help of neat diagram.

2. **Attempt any FOUR of the following :** 16

   (a) Differentiate between AM and FM on the basis of : definition, bandwidth, modulation index and application.

   (b) Describe FM generation using reactance modulator.

   (c) (i) Calculate modulation index if modulating frequency in FM is 1 kHz and maximum deviation is 1.6 kHz.

   (ii) Draw the waveform of PAM and PWM.

   (d) Define Noise. Give the causes and effect of thermal noise.

   (e) Explain ionosphere layers and ionospheric propagation.

   (f) Describe the concept of actual height and virtual height related to wave propagation.

3. **Attempt any FOUR of the following :** 16

   (a) Describe PWM generation using IC 555.

   (b) Explain working principle of duct propagation.

   (c) Describe Yagi-uda antenna with its radiation pattern.

   (d) Draw radiation pattern of following length resonant dipole antenna :

   (i) $l = \lambda$

   (ii) $l = \lambda/2$

   (iii) $l = 3\lambda/2$

   (iv) $l = 3\lambda$

  (e) Compare resonant and non-resonant antenna on the basis of :

    (i) Definition

    (ii) Reflection co-efficient

    (iii) Radiation pattern

    (iv) Applications

  (f) Write one application of following antenna :

    (i) Loop antenna

    (ii) Dish antenna

    (iii) Horn antenna

    (iv) Yagi-uda antenna

4. **Attempt any FOUR of the following :**   **16**

  (a) State the need of AGC and explain it's types.

  (b) Describe practical diode detector with neat diagram.

  (c) Draw and explain PLL as a FM demodulator.

  (d) Draw the superheterodyne type FM radio receiver, how it is differ from superheterodyne type AM receiver.

  (e) Define sensitivity and selectivity of radio receiver.

  (f) Describe the concept of interlaced scanning with neat diagram.

5.   **Attempt any FOUR of the following :**   16

   (a)   Draw the block diagram of AM superheterodyne radio receiver. Also draw the waveform for output of each block.

   (b)   Describe balanced slope detector with neat diagram.

   (c)   Define : hue, luminance, saturation and viewing distance with respect to TV.

   (d)   State CCIR – B standards for colour signal transmission and reception.

   (e)   Compare additive colour mixing with subtractive colour mixing.

   (f)   Draw composite video signal and state use of the blanking pulse and colour burst.

6.   **Attempt any FOUR of the following :**   16

   (a)   Define : pedestal height, blanking pulse, colour burst and horizontal synchronising pulse.

   (b)   Describe the working principle of colour picture tube.

   (c)   Describe colour TV transmission with block diagram.

   (d)   Explain home security application of CCTV system.

   (e)   Describe plumbicon camera tube with neat diagram.

   (f)   compare CATV and CCTV. (any four points)

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