

17439

15162

3 Hours / 100 Marks

Seat No.

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

Marks

1. (A) Attempt any SIX of the following :

12

- (a) Define noise. List the types of noise.
- (b) Represent FM signal in Time domain and frequency domain.
- (c) Explain concept of Actual height and Virtual height.
- (d) Define directive gain and directivity for antenna.
- (e) Compare AM Tune Radio Frequency Receiver and AM Superheterodyne Radio Receiver. (any 2 points)
- (f) Justify the choice of a rectangular frame width to height ratio equal to 4 : 3 of TV.
- (g) Compare vidioccon and plumbicon camera tubes w.r.t. principle and advantage.
- (h) State advantages of HDTV. (any 2)

(B) Attempt any TWO of the following :

8

- (a) Define Modulation. List advantages of Modulation. (any 3)
- (b) A 600 W carrier is modulated to depth of 75% calculate,
 - (i) Total power in AM wave
 - (ii) Power in sidebands
- (c) Compare between AM and FM. (any 4 points)

2. Attempt any FOUR of the following : 16

- (a) Give mathematical representation of AM wave to obtain complete expression.
- (b) Explain the concept of pre-emphasis and de-emphasis with typical circuit diagram.
- (c) (i) Draw FM signal generation diagram using IC 566.
(ii) Draw generation of PAM transistorized circuit diagram.
- (d) Draw block diagram of basic electronic communication system and explain each block.
- (e) Describe Duct propagation.
- (f) Explain ground wave propagation with suitable diagram.

3. Attempt any FOUR of the following : 16

- (a) Compare pulse width modulation with pulse position modulation w.r.t. definition waveforms, noise immunity and bandwidth requirement.
- (b) Explain sky wave propagation with diagram.
- (c) Draw Yagi-Uda Antenna and its Radiation pattern and explain its operation.
- (d) Describe half wave dipole antenna with diagram and its radiation pattern.
- (e) Differentiate resonant and non-resonant antenna for two points.
- (f) (i) Draw Radiation pattern for the following resonant dipole of following length. (1) $l = \lambda/2$ (2) $3\lambda/2$
(ii) Draw structure of Loop antenna. Give two applications of Loop antenna.

4. Attempt any FOUR of the following : 16

- (a) Explain need of AGC. Also explain simple AGC used in radio receiver.
- (b) Define following characteristics of AM Radio Receiver :
 - (i) Sensitivity
 - (ii) Selectivity
 - (iii) Fidelity
 - (iv) Noise Figure
- (c) Draw block diagram of FM Radio Receiver and explain the function of Mixer and Limiter.

- (d) Explain Balance Slope Detector with circuit diagram.
- (e) Draw and explain circuit diagram of practical diode detector.
- (f) Explain Interlace scanning with diagram write advantages of Interlace scanning.

5. Attempt any FOUR of the following :

16

- (a) Explain image frequency and its rejection.
- (b) Describe PLL based FM detector with circuit diagram.
- (c) Define Luminance, Hue, Saturation and Chrominance applied to colour TV system.
- (d) Define Pedestal height. Draw neat labelled diagram of composite video signal.
- (e) Explain Additive Mixing and Subtractive Mixing with appropriate diagram.
- (f) List any eight CCIRB TV standards.

6. Attempt any FOUR of the following :

16

- (a) Draw sync separator circuit and explain the need of synchronization pulse.
 - (b) Describe working principle of colour picture tube with neat diagram.
 - (c) Draw block diagram PAL-D colour TV receiver.
 - (d) Explain Home security operation of CC TV System.
 - (e) Explain solid state camera based on CCD with appropriate diagram.
 - (f) State any two applications of MATV, CATV.
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