

17439

14115

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.

Marks

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

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- (i) Define modulation. Explain the need of modulation. (Two points)
- (ii) Compare analog signal & digital signal with respect to
 - (a) Definition (b) Advantages.
- (iii) Explain the cause of fading of signal.
- (iv) State the applications of CCTV.
- (v) State Grassman's law & its significance.
- (vi) Draw waveforms for modulating signal, carrier and FM output.
- (vii) Explain the principle of plumb icon camera tube.
- (viii) Define (a) Polarization (b) Beam width

(B) Attempt any TWO of the following :

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- (i) Compare pre-emphasis & de-emphasis with
 - (a) Diagram (b) response curve.
- (ii) Draw frequency spectrum of FM wave.
- (iii) Draw the radiation pattern for resonant antenna for $l = \frac{\lambda}{2}$ & $l = \lambda$.



P.T.O.

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

- (i) For AM transmission having carrier power 50 kW, modulated to a depth of 60%. Calculate
 - (a) Total transmitted power
 - (b) Power in each side band
- (ii) Calculate modulation index in FM if modulating frequency is 1 kHz and a frequency deviation is 2 kHz.
- (iii) Define noise. State various types of internal & external noise. Give causes and effects of thermal noise.
- (iv) Draw different layers of sky wave propagation & explain.
- (v) Define skip distance & MUF with suitable sketch.
- (vi) Draw block diagram of Armstrong modulation system.

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

- (i) Explain PAM with waveforms and write its applications.
- (ii) Explain PWM using IC 555. Draw waveforms.
- (iii) Draw Yagi-Uda antenna. Draw its radiation pattern. Write its applications.
- (iv) Define following characteristics of AM radio-receiver.
 - (a) sensitivity (b) selectivity
- (v) Distinguish between folded dipole and straight dipole antenna with respect to construction, input Impedance, radiation pattern & application.
- (vi) What is picture resolution ? Explain horizontal resolution.

4. Attempt any FOUR of the following : 16

- (i) Draw the diagram of folded dipole antenna & describe its radiation pattern.
- (ii) Explain FM demodulator using PLL with diagram.
- (iii) What is colour burst ? Why is it transmitted along with composite video signal ?
- (iv) Explain practical diode AM detector with neat waveforms.
- (v) Describe ground wave propagation with diagram.
- (vi) Draw block diagram of signal distribution in a cable TV system & explain.

5. Attempt any FOUR of the following : 16

- (i) Define – (i) Directivity (ii) Maximum directive gain.
- (ii) Explain the need of AGC. Explain different types of AGC with graph.
- (iii) Draw & explain AM super-heterodyne radio receiver with waveforms at output of each block.
- (iv) Draw block diagram of PAL-D decoder. State function of H & V demodulator.
- (v) Draw the block diagram of FM receiver. State the function of amplitude limiter stage.
- (vi) Write applications of Dish antenna and Horn antenna.

6. Attempt any FOUR of the following : 16

- (i) List any eight CCIRB TV standards.
- (ii) Draw block diagram of PAL colour encoder. Explain how composite colour signal is formed.

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- (iii) Describe equalizing pulses.
 - (iv) State the values of IF and broadcast frequency range for
 - (a) AM radio receiver
 - (b) FM radio receiver.
 - (v) Explain space wave propagation.
 - (vi) Explain interlaced scanning with neat sketch.
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