16172

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

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

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

(3) Figures to the right indicate full marks.

(4) 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) Draw the waveform of analog and digital signal and define it.

(b) Represent FM signal in time domain and frequency domain.

(c) Draw transverse electromagnetic wave. Why electromagnetic wave is called as transverse wave ?

(d) Draw labelled sketch of Yagi-Uda antenna.

(e) Write the intermediate frequency values for AM and FM.

(f) What is aspect ratio ?

(g) Write the working principle of Vidicon tube.

(h) State the applications of CCTV.

(B) Attempt any TWO of the following : **8**

(a) Define AM and FM. Draw waveforms of AM and FM.

(b) Draw the circuit diagram of BJT AM modulator. Write its working.

(c) Explain Pre-emphasis and De-emphasis with neat diagram.

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

(a) Derive equation for AM wave. Give meaning of AM from the derived mathematical equation.

(b) Explain the concept of pre-emphasis with neat circuit diagram.

(c) (i) Write applications of FM (any 2).

(ii) Compare PWM and PPM (any 2 points).

(d) Define noise. What are the types of noise ? What are the causes and effect of thermal noise ?

(e) Explain troposphere scatter propagation with neat waveform.

(f) Define :

(i) Critical frequency

(ii) Skip distance

(iii) Fading

(iv) MUF

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

(a) Explain generation of PAM with waveform and write its advantages.

(b) Describe ionosphere layers with neat diagram.

(c) Draw loop antenna. Draw its radiation pattern. Give its applications.

(d) Draw labelled sketch of folded dipole antenna. Give its definition and draw radiation pattern.

(e) Define-polarization, bandwidth, beamwidth, directivity.

(f) (i) What are the types of Microwave antenna ?

(ii) Draw radiation pattern of resonant antenna.

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

(a) Draw the block diagram of AM superheterodyne radio receiver. Write function of each block.

(b) What is the need of AGC ? What are its types ?

(c) Draw circuit diagram of balance slop detector and write its working.

(d) Draw the block diagram of FM demodulator using PLL. Write down function of each block.

(e) Draw circuit diagram of practical diode detector and write its operation.

(f) State Grassman's law. Define Additive colour mixing.

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

(a) What is the concept of image frequency and its rejection ?

(b) Draw the superheterodyne type FM radio receiver and write function of each block.

(c) Define :

(i) Hue

(ii) Luminance

(iii) Viewing distance

(iv) Saturation

(d) What is the necessity of equalizing pulses ? What is the purpose of pre-equalizing and post-equalizing pulses ?

(e) Sketch a labelled diagram of vestigial sideband transmission.

(f) List any 8 CCIRB standard for colour signal.

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

(a) Draw labelled sketch of composite video signal.

(b) Draw and write operation of Plumbicon tube.

(c) Draw block diagram of PALD colour receiver.

(d) Compare CATV and CCTV with any 4 points.

(e) Compare Vidicon and Plumbicon tube.

(f) Draw labelled block diagram of colour TV transmitter.
