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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.

(7) 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**

(i) State the concept of transmission bandwidth.

(ii) Define modulation index for FM. Write the expression of FM wave.

(iii) Compare actual height and virtual height.

(iv) Define the term power gain and antenna gain.

(v) Compare TRF receiver with super heterodyne receiver on sensitivity and selectivity parameters.

(vi) State Grassman's law.

(vii) State the working principle of vidicon camera.

(viii) Write the applications of CCTV.

Marks

b) **Attempt any TWO of the following:** **8**

(i) Define modulation and state its need.

(ii) Describe the concept of SSB and DSB transmission.

(iii) Describe the generation of FM by varactor diode method.

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

a) Calculate the percentage saving in power if only one sideband is transmitted at 80% modulation.

b) Describe Pre-emphasis and De-emphasis with circuit diagram.

c) Compare PAM and PWM. Four points.

d) Draw the block diagram of electronic communication system and describe the working of each block.

e) Describe troposhere scatter propagation.

f) Describe ground wave propation with diagram.

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

a) Describe the working of generation of PPM using IC 555. Draw necessary ckt diagrams and waveforms.

b) Describe the following terms:

(i) critical frequency

(ii) skip distance

(iii) fading

(iv) maximum usable frequency

c) Describe the working of Yagi-Uda Antenna with its constructional sketch and radiation pattern.

d) Describe the radiation pattern for resonant dipole antenna with $l = \frac{\lambda}{2}$, $l = \lambda$, $l = \frac{3\lambda}{2}$, $l = 3\lambda$

e) Define polarization, band width, beam width and antenna resistance for antenna.

f) Describe the working of rectangular microstrip antenna.

Marks

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

a) Describe the working of practical diode detector with circuit diagram and waveforms.

b) Describe image frequency and its rejection.

c) Draw the block diagram of FM super heterodyne radio receiver and describe its working.

d) Describe the working of balanced slop detector using circuit diagram.

e) Describe the working of delayed AGC with its circuit diagram.

f) Describe horizontal and vertical resolution in TV.

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

a) Draw the block diagram of super heterodyne receiver and describe the working of each block.

b) Describe the working of FM demodulator using PLL. Draw its circuit diagram.

c) Define the following terms:

(i) Viewing distance

(ii) Luminance

(iii) Hue

(iv) Saturation

d) List CCIR B standard for colour TV (any eight).

e) Describe the image continuity and interlace scanning

f) Describe pre equalizing pulses and post equalizing pulses.

Marks

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

a) Draw complete composite video signal and label it.

b) Describe the working of PIL colour picture tube with its diagram.

c) Describe the working of PAL D colour TV receiver with the help of block diagram.

d) Describe the working of HDTV with its block diagram.

e) Describe the working of solid state camera based on CCD with diagram.

f) Draw the block diagram of colour TV transmitter and explain its working.