

22392

23124

3 Hours / 70 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) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define Simplex and Duplex mode of electronic communication system.
- (b) State the need of modulation.
- (c) Define frequency modulation (FM).
- (d) List two applications of Microwave frequency.
- (e) State sampling theorem and what is Nyquist rate ?
- (f) State two applications of Fiber optic cable.
- (g) Define Beamwidth and Antenna gain.

2. Attempt any THREE of the following :

12

- (a) Explain sources of noise in communication system.
- (b) Draw and explain time domain and frequency domain representation of AM.
- (c) Explain Simple AGC and Delayed AGC with the suitable diagram.
- (d) Describe working of DPCM with block diagram.
- (e) Draw and explain the Electromagnetic Spectrum Frequency of bands and applications.



3. Attempt any THREE of the following : 12

- (a) A 500 Watts carrier is modulated to a depth of 80%. Calculate
 - (1) Total power in AM Wave
 - (2) Power in side band
- (b) Draw neat block diagram of FM Receiver and explain function of each block.
- (c) Describe basic concept of Ground Wave and Sky Wave propagation.
- (d) Draw and explain block diagram of communication system.
- (e) Explain basic concept of PWM with suitable waveform.

4. Attempt any THREE of the following : 12

- (a) In FM, if maximum deviation is 65 KHz and maximum modulating frequency is 10 KHz, calculate
 - (1) Deviation Ratio
 - (2) Bandwidth of FM
- (b) Explain the effect of modulation index on AM Wave with neat waveforms.
- (c) List different types of Antenna and explain any one type of antenna.
- (d) Compare AM and FM on the basis of :
 - (1) Definition
 - (2) Bandwidth
 - (3) Modulation index
 - (4) Application
- (e) Explain the meaning of “slope overload” and “granular noise” of Delta Modulation System.

5. Attempt any THREE of the following :**12**

- (a) Draw neat block diagram of PCM Transmitter and Receiver and explain its working.
- (b) A modulating signal $9 \sin(2\pi \times 10^2 t)$ is used to modulate a carrier signal $12 \sin(2\pi \times 10^3 t)$. Find
 - (1) Modulation index
 - (2) Frequency of sideband component & their amplitude
- (c) Compare PCM, DM and ADM on the basis of following points :
 - (1) No. of bits
 - (2) Step size
 - (3) Error
 - (4) Maximum bit rate
- (d) Draw Practical Diode Detector and explain its working.
- (e) Explain construction of coaxial cable with diagram. State its applications.

6. Attempt any TWO of the following :**12**

- (a) The equation of FM Wave is given by $10 \sin(6 \times 10^8 t + 5 \sin 1250 t)$, calculate
 - (1) Carrier Frequency
 - (2) Modulating Frequency
 - (3) Maximum deviation (δ)
 - (4) Power dissipated in 20Ω Resistor.
 - (b) What is meant by quantization error ? Describe quantization process in brief.
 - (c) Draw the block diagram of AM Super-heterodyne Receiver and explain working of each block.
-

