

22392

24225

3 Hours / 70 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.
  - (5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) Write the elements of Electronic Communication System.
- (b) Define SNR & Electrical noise.
- (c) Define Simplex & Duplex mode of electronic communication system.
- (d) State the need of modulation.
- (e) State sampling theorem.
- (f) Define Beamwidth and Antenna gain.
- (g) Write applications of fibre optic cable.

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

**12**

- (a) Describe the sources of noise in communication system.
- (b) Draw the waveforms of Amplitude modulation.
- (c) Draw and explain PLL as a FM demodulator.



- (d) State different types of pulse modulation. Draw waveform of PWM.
- (e) Enlist different data transmission modes. Describe any one in brief.

**3. Attempt any THREE of the following :**

**12**

- (a) Explain frequency band of Electromagnetic spectrum with diagram.
- (b) Differentiate between AGC and delayed AGC. (Any four points)
- (c) Draw circuit diagram of practical AM diode detector with input and output waveform.
- (d) Determine the percentage of modulation for FM with frequency deviation of 10 kHz, if maximum deviation is 25 kHz.
- (e) Explain Quantization process. How Quantization error can be removed ?

**4. Attempt any THREE of the following :**

**12**

- (a) An AM transmitter uses a carrier wave of 10 MHz with 10 V amplitude. It is modulated to a depth of 50% with a signal of 5 kHz. Represent AM signal in time and frequency domain.
- (b) The equation of FM wave is given by  $20 \sin (8 \times 10^8 t + 3 \sin 10^4 t)$ . Calculate (i) Carrier frequency (ii) Modulation frequency (iii) Modulation index (iv) Power dissipated in  $10 \Omega$  resistor.
- (c) Draw block diagram of Adaptive delta modulation and write its applications.
- (d) Differentiate between AM & FM on the basis of (i) Definition (ii) Modulation Index (iii) Bandwidth (iv) Application.
- (e) State application of each of the following :
  - (i) Array Antenna
  - (ii) Wire Antenna
  - (iii) Micro Strip Antenna
  - (iv) Reflector Antenna

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

- (a) Explain working of simple diode detector with input and output waveforms.
- (b) Draw and explain, how ratio detector can be used as FM detector.
- (c) Explain function of each block of PCM.
- (d) Compare Delta Modulation & ADM.
- (e) Explain construction of coaxial cable with diagram.

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

- (a) Explain Superhetrodyne receiver with neat sketch and draw its waveforms.
  - (b) Draw and explain Armstrong method to generate FM wave.
  - (c) Explain concept of PAM, PWM & PPM with waveforms and applications.
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