

## Scheme – I

### Sample Question Paper

**Program Name** : Diploma in Digital Electronics  
**Program Code** : DE  
**Semester** : Fourth  
**Course Title** : Analog and Digital Communication  
**Marks** : 70

**22424**

**Time: 3 Hours**

---

#### 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) Preferably, write the answers in sequential order.

#### Q.1 Attempt any FIVE of the following.

**10 Marks**

- a) Define analog and digital signal with its example.
- b) Define modulation and state the need of modulation.
- c) Compare AM and FM on the basis of
  - i) Definition
  - ii) Bandwidth.
- d) Draw the block schematic of Delta modulation transmitter.
- e) State the advantages of ADM.
- f) Define multiplexing. State its need.
- g) List any four advantages of TDMA over FDMA.

#### Q.2 Attempt any THREE of the following.

**12 Marks**

- a) Describe different modes of electronics communication.
- b) Describe with neat block diagram Armstrong method of FM generation.
- c) A super heterodyne radio receiver with an IF of 455 KHz is tuned to 100 KHz. Find Image frequency and Local oscillator frequency.
- d) Describe the effects of noise on channel. Also state the need of channel modeling.

#### Q.3 Attempt any THREE of the following.

**12 Marks**

- a) Describe the concept of transmission bandwidth. Define noise and state its types.
- b) Describe with neat diagram and waveform generation of PPM using IC 555.
- c) Compare between simple AGC and delayed AGC. (any four points)

d) State and explain Sampling theorem with necessary waveform.

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

**12 Marks**

- a) Describe the pre-emphasis and de-emphasis networks used in FM transmission and reception.
- b) Draw and describe the practical AM diode detector circuit. Sketch input and output waveforms.
- c) Describe quantization and quantization error.
- d) Draw and describe the ADM transmitter and receiver with neat waveforms.
- e) Describe the concept of CDMA technology.

**Q.5 Attempt any two of the following.**

**12 Marks**

- a) An audio signal  $20\sin(2\pi \times 500t)$  is used to amplitude modulate a carrier of  $80\sin(2\pi \times 10^5 t)$ .  
Determine:
  - i. Modulation index,
  - ii. side band frequencies,
  - iii. Amplitude of each sideband frequency,
  - iv. Bandwidth required,
  - v. Total power delivered into a load of  $600\Omega$ . And
  - vi. Power saved if one of the sideband is suppressed.
- b) Describe the block diagram of FM super heterodyne receiver and state its advantages and disadvantages.
- c) Elaborate the need of QAM. Draw and describe the block diagram of QAM generation system with waveforms.

**Q.6 Attempt any two of the following.**

**12 Marks**

- a) Compare AM and FM with respect to following points:
  - i) Definition, ii) Modulation index, iii) Power required, iv) Bandwidth, v) Number of sidebands and vi) Application.
- b) Draw and describe the block diagram of PCM transmitter and receiver with necessary waveforms.
- c) Describe QPSK modulator and demodulator. Draw its constellation diagram. Write its advantages and disadvantages.

**Scheme – I**  
**Sample Test Paper - I**

**Program Name** : Diploma in Digital Electronics  
**Program Code** : DE  
**Semester** : Fourth  
**Course Title** : Analog and Digital Communication  
**Marks** : 20

**22424**

**Time: 1 Hour**

---

**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) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) State importance of electronic communication system.
- b) State the advantages of super heterodyne receiver over tuned radio frequency receiver.  
(Any two)
- c) Define pulse modulation. State its types.
- d) Write the mathematical expression for modulation index with respect to AM and FM.
- e) Define selectivity and sensitivity of AM receiver.
- f) State the need of AGC. List the types of AGC.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Draw the block diagram of basic communication system. State the function of each block in detail.
- b) What is image frequency? How it can be rejected?
- c) A 600w carrier is modulated to depth 75%. Calculate total power in AM wave and power in sidebands.
- d) Describe with neat diagram PLL as FM Demodulator.
- e) Represent AM and FM wave in time and frequency domain.

**Scheme – I**  
**Sample Test Paper - II**

**Program Name** : Diploma in Digital Electronics  
**Program Code** : DE  
**Semester** : Fourth  
**Course Title** : Analog and Digital Communication  
**Marks** : 20

**22424**

**Time: 1 Hour**

---

**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) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) State any two advantages and disadvantages of digital communication system.
- b) State sampling theorem.
- c) State the limitations of DM.
- d) State the principle of orthogonality.
- e) Write the bandwidth requirement of ASK, FSK, BPSK and QPSK.
- f) Draw the block diagram of QAM receiver.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Draw the block diagram of basic digital communication system. State the function of each block in detail.
- b) Explain with neat block diagram DPCM receiver.
- c) Compare FDMA TDMA and CDMA (any four correct points)
- d) Define multiplexing. Describe the need of multiplexing.
- e) Draw and Explain with neat diagram & waveform ADM.