

Scheme G
Sample Test Paper -I

Course Name : Diploma in Medical Electronics

Course Code : MU

Semester : Fourth

Subject Title : Communication Techniques

Marks : 25

17438

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

Q1. Attempt any THREE from following

(09 Marks)

- a. Draw electromagnetic spectrum and state the frequency ranges used for radio, TV, Microwave and fiber optics communication
- b. Define modulation. State necessity of modulation.
- c. State three advantages of digital communication over analog communication
- d. What is bit rate, baud rate? Give bit rate and baud rate for FSK and QPSK?
- e. State frequency range used for AM and FM. Give bandwidth requirement of AM and FM. Why FM reception is more immune to noise.

Q2. Attempt any TWO from following

(08 Marks)

- a. What is noise? What are its types? Give sources of noise. State its effects on analog and digital communication
- b. State the sampling theorem and explain sampling process.
- c. Draw the circuit diagram of FM generation using varactor diode. Give its working.

Q3. Attempt any TWO from following

(08 Marks)

- a. Define amplitude modulation and its modulation index. Draw a sketch of sinusoidal modulated AM waveform and write expression for amplitude modulated wave.
- b. State any four advantages of PCM. List two applications of it.

- c. Find the carrier and modulating frequencies, the modulation index and maximum deviation of FM wave represented by voltage equation

$$V=12 \sin(6 \times 10^8 t + 5 \sin 1250 t)$$

Scheme G
Sample Test Paper -II

Course Name : Diploma in Medical Electronics

Course Code : MU

Semester : Fourth

Subject Title : Communication Techniques

Marks : 25

17438

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

Q1. Attempt any THREE from following

(09 Marks)

- a. Define i) Elevation Angle ii) Azimuth Angle iii) Foot Print
- b. What is role of transponder in satellite? Draw its block diagram and give its function.
- c. Define i) cell ii) cell cluster iii) Frequency reuse.
- d. What is router? Where it is used? State any four advantages of router
- e. List any six protocols available in TCP/IP suite and purpose/ function of each protocol.

Q2. Attempt any TWO from following

(08 Marks)

- a. What is digital signature? How it works? State its three advantages.
- b. Write step by step procedure for call processing between mobile to mobile.
- c. Why layered approach is used in network model. State any four functions of network layer

Q3. Attempt any TWO from following

(08 Marks)

- a. State the benefits of LAN (Any eight).
- b. What is cell spitting and cell sectorisation. Illustrate with suitable diagrams
- c. Draw block diagram of satellite communication system. Give its working.

www.puneqp.com

Scheme G
Sample Question Paper

Course Name : Diploma in Medical Electronics

Course Code : MU

17438

Semester : Fourth

Subject Title : Communication Techniques

Marks : 100

Time: 3 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

Q1. [A] Attempt any SIX from following (12 Marks)

- a. Define modulation index of AM and FM.
- b. What is footprint and station keeping as applicable to satellite?
- c. Name network devices one each which operates at physical level, data link layer, network layer, application layer.
- d. List any four types of digital modulation techniques
- e. What is WDM? Where is it used?
- f. What is co-channel and adjacent channel interference?
- g. State working principle of FDM and its any one application
- h. Define Altitude control and state its need

[B] Attempt any TWO from following (8 Marks)

- a. State bandwidth requirement for FSK, BPSK, QPSK and DPSK
- b. What is cell? What are its types? Describe cell splitting and sectorization
- c. Define bit, frame, packet and segments. Write the name of OSI layer which uses these entities

Q2. Attempt any FOUR from following (16 Marks)

- a. State the meaning of the terms i) Information ii) Message iii) Channel iv) Channel Noise
- b. State any four advantages of pulse amplitude modulation over amplitude modulation.
- c. What is channel coding? Give its types. Draw waveforms to illustrate differential Manchester coding
- d. Draw the block diagram PCM transmitter. State the role of sample and hold circuit.
- e. A broadcast transmitter radiates 50 KW of carrier power. What will be the radiated power at 85 percent modulation
- f. Compare PAM, PWM with respect to principle, power content, output waveforms and applications

Q3. Attempt any FOUR from following (16 Marks)

- a. How PPM is obtained from PWM? State two advantages of PPM
- b. Draw the waveforms of amplitude modulation for modulation index 50%, 100% and 150 %. Classify them as under modulation and over modulation.
- c. Write step by step procedure for cellular call processing from wireline (PSTN) to mobile (cellular)
- d. What is QPSK? State its principle. Draw the block diagram to generate QPSK
- e. Draw circuit diagram of diode detector. Write its operation with relevant waveforms
- f. State the basic concept of the following
 - i) tele psychiatry
 - ii) tele dermatology

Q4. Attempt any FOUR from following (16 Marks)

- a. Draw the block diagram of mobile communication and state function of each block.
- b. What is Handoff? State various handoff techniques used in mobile communication
- c. State the meaning of the terms i) Confidentiality ii) Integrity iii) Authentication iv) Digital Signature
- d. State the network devices used for
 - a. Connecting a node to server which is at a distance of 150 meter
 - b. Connecting node to each other
 - c. Connecting two similar networks

- d. Connecting two dissimilar networks
- e. What is Biotelemetry? Describe briefly its operation with block diagram
- f. What is internet based medical services? Give ethical and legal aspects of it.

Q5. Attempt any FOUR from following (16 Marks)

- a. Draw the architecture of OSI and TCP/IP model. Why TCP/IP is preferred in network systems?
- b. What are different types of data transmission? Compare synchronous and asynchronous transmission
- c. Compare Star and Ring topology with respect to i) Arrangement of nodes ii) Unit used for data transmission iii) Standards used iv) Ease of installation and maintenance
- d. What is the role of transponder in satellite communication? Describe its operation with block diagram.
- e. Compare LAN and WAN with respect to following point
 - i) Extend of geographical area
 - ii) Basic Structure Diagram
 - iii) Speed
 - iv) Application
- f. State any four applications of telemetry in patient care.

Q6. Attempt any FOUR from following (16 Marks)

- a. Draw the waveform for the data bit stream 10110101 for i) Unipolar NRZ ii) Polar RZ iii) Manchester Code iv) Bipolar AMI
- b. What is delta modulation? What is its limitation? How is it overcome?
- c. A voice signal of telephone (0 to 4 KHz) is to be digitized using PCM. Calculate i) Nyquist rate ii) Number of quantization levels to encode each sample into 7 bit ASCII code iii) Maximum quantization noise in terms of step size.
- d. What is Uplink and Downlink? Write frequency ranges used for C Band and Ku band for Uplink and downlink. Why uplink frequency is higher than down link frequency?.
- e. What are different types of satellite orbits? What is geostationary satellite?. State advantages of geostationary satellite.
- f. What is CDMA? State any three advantages of it over TDMA and FDMA.