

Sample Test Paper-I

Course Name : Diploma in Medical Electronics

Course : MU

Semester : Fifth

Subject : Diagnostic Equipment

Marks : 25

17545

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.

09 Marks

- a) Define any three respiratory parameters.
- b) Differentiate between Direct and indirect BP measurement. (any three)
- c) State and explain Beer- Lambert law
- d) Draw the block of direct blood pressure measurement technique.

Q2. Attempt any Two

08 Marks

- a) Draw block diagram of digital blood pressure meter and describe it.
- b) Describe the principle of pulse oximetry.
- c) Draw block diagram of Digital Temperature Indicator / meter & describe it.

Q3. Attempt any Two

08 Marks

- a) List technical specifications of Respiration Rate Meter (any 4)
- b) Draw block diagram of Ultrasonic FHR Meter. Give working principle of it.
- c) Draw labeled block diagram of pure tone audiometer. State the function of noise generator and bone vibrator.

Sample Test Paper-II

Course Name : Diploma in Medical Electronics

Course : MU

Semester : Fifth

Subject : Diagnostic Equipment

Marks : 25

17545

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.

09 Marks

- a) Describe the generation of EMG signal.
- b) Draw EEG spectrum and explain it.
- c) List technical specifications of ECG machine. (any six)
- d) Describe 10-20 Electrode system of EEG.

Q2. Attempt any Two.

08 Marks

- a) Describe working principle of EMG machine with suitable diagram.
- b) Compare unipolar and bipolar limb leads.
- c) List technical specifications of EEG machine. (any four)

Q3. Attempt any Two.

08 Marks

- a) Draw EMG Preamplifier circuit and explain it.
- b) Draw Wilson network in ECG machine and give its importance in ECG machine.
- c) Mention steps required for calibration of ECG machine.

Sample Question Paper

Course Name : Diploma in Medical Electronics

Course : MU

Semester : Fifth

Subject : Diagnostic Equipment

Marks : 100

17545

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.

Q1. A) Attempt any THREE

(12 Marks)

- a) Draw blood pressure waveform and define following terms:
 - i. Systolic Blood Pressure
 - ii. Dichrotic Notch
- b) Draw block diagram of Pulse Oxymeter and describe it.
- c) Illustrate following methods to measure the heart rate:
 - i. Average
 - ii. Bit to bit
- d) Describe the significance of Vector Cardiography

Q1. B) Attempt any ONE

(06 Marks)

- a) Draw different lead configurations which can be obtained using limb electrodes.

List various chest electrodes with their positions.
- b) Draw fault finding tree of EEG machine.

Q2. Attempt any FOUR

(16 Marks)

- a) Draw and describe operation of digital blood pressure meter in detail.
- b) Give technical specifications of Heart Rate Meter.(any 4)
- c) Give the importance of microphone, amplifier and earphone in hearing aid and . Suggest which type of deficiency of human body it can overcome.
- d) Describe 1 MV calibration network in ECG machine with suitable diagram.
- e) Describe the generation of EMG signal.
- f) Draw block diagram of PCG machine and explain it.

Q3. Attempt any FOUR**(16 Marks)**

- a) Differentiate between direct and indirect blood pressure measurement techniques.
(Any four points).
- b) Draw the block diagram of heart rate meter and describe it.
- c) Draw preamplifier circuit of EEG machine.
- d) How four sounds are produced during one complete cardiac cycle?
- e) Describe the generation of ECG signal.

Q4. A) Attempt any THREE**(12 Marks)**

- a) State effects of removing of comparator and monostable multivibrator from respiration rate meter?
- b) Draw block diagram of Bekesy Audiometer & state function of each block..
- c) Draw block diagram of ECG machine and state function of each block .
- d) Give the procedure to measure sensory and motor nerve conduction velocity with suitable diagram.

Q4. B) Attempt any ONE**(06 Marks)**

- a) An ECG machine is received with the following problems. State the remedies to eliminate it.
 - i. ECG trace not available.
 - ii. ECG trace too light.
 - iii. ECG trace too dark.
 - iv. ECG baseline is shifting.
 - v. Machine is not getting switched on.
 - vi. ECG signal is noisy.
- b) Draw and describe recording techniques of EEG signal.

Q5. Attempt any FOUR**(16 Marks)**

- a) List technical specifications of Digital Temperature Indicator. (any four)
- b) Describe working principle of Spirometer with neat labeled diagram.
- c) Draw the block diagram of GSR meter and describe it.
- d) Compare between ECG and PCG. (any four)
- e) Define following respiratory parameters.
 - i. Tidal Volume
 - ii. Residual Volume
 - iii. Vital Capacity

- iv. Inspiratory Reserve Volume
- f) Draw block diagram of EMG machine and state the function of each block.

Q6. Attempt any FOUR

(16 Marks)

- a) Draw right leg drive circuit in ECG machine and state its importance.
- b) Describe air and bone conduction with neat diagram.
- c) Give details about Systemic temperature and skin temperature.
- d) Mention any four possible faults which can occur in EMG machine and give its solution to rectify it.
- e) Describe the speech audiometer and impedance audiometer.