

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, APRIL - 2024**

BIOMEDICAL INSTRUMENTS

[Maximum marks: 100]

[Time: 3 Hours]

PART – A

Maximum marks: 10

I. (Answer *all* the questions in one or two sentences. Each question carries **2** marks)

1. Define systolic pressure.
2. Draw the Einthoven's Triangle.
3. State the need of defibrillators.
4. List any two functions of hemodialysis machine.
5. Write any two applications of biotelemetry. (5 x 2 = 10)

PART – B

Maximum marks: 30

II. (Answer any *five* of the following questions. Each question carries **6** marks)

1. Explain the working principle of piezoelectric arterial pulse receptors.
2. Explain the operation of electromagnetic blood flow meter.
3. Draw and explain different parts of ECG wave form.
4. Explain the different electrodes used for EMG measurement.
5. Compare implantable and external pacemakers.
6. State the precautions to be taken while handling biomedical instruments.
7. Define micro shocks and macro shocks. (5 x 6= 30)

PART – C

Maximum marks: 60

(Answer *one full* question from each unit. Each full question carries **15** marks)

UNIT – I

- III.** (a) Explain the formation of action potential in a cell. (8)
- (b) Explain indirect blood pressure measurement using sphygmomanometer. (7)

OR

- IV.** (a) Describe the working of photoelectric pulse transducer. (8)
(b) Illustrate operation of ultrasonic blood flow meter. (7)

UNIT - II

- V.** (a) Describe the block diagram of an ECG machine. (8)
(b) What are the different frequency regions in EEG? Explain. (7)

OR

- VI.** (a) Draw the 10 – 20 electrode Lead system of EEG. (8)
(b) Explain the block diagram of EMG. (7)

UNIT - III

- VII.** (a) Describe the operation of ventricular synchronous demand pacemaker. (8)
(b) Describe the working principle of electrical conductivity type blood cell counter. (7)

OR

- VIII.** (a) Explain the working of Ultrasonic diathermy unit. (8)
(b) Describe DC defibrillator. (7)

UNIT – IV

- IX.** (a) Explain the block diagram of X-ray machine. (8)
(b) Draw and explain the block diagram of MRI scanning system. (7)

OR

- X.** (a) Explain A Scan, B Scan and M Scan of ultrasonic imaging. (8)
(b) Explain the block diagram of biotelemetry system. (7)
