

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023**

BIOMEDICAL INSTRUMENTS

[Maximum Marks: **100**]

[Time: **3** Hours]

PART-A

[Maximum Marks: **10**]

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

1. List any two criteria for selecting biomedical transducers.
2. Draw a typical ECG wave form.
3. State the needs of a pacemaker.
4. What is a respirator?
5. Define macro shock.

(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 optical fiber temperature sensor.
2. Define a) Bio electricity b) Resting potential c) Action potential
3. Describe Einthoven's triangle.
4. Explain the different frequency regions of EEG wave form.
5. Explain any one type of shortwave diathermy.
6. Draw and explain the block diagram of biotelemetry system.
7. Explain the effect of electricity and electromagnetic radiation in the Human body.

(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 any one method of indirect blood pressure measurement. (8)
b. Explain principle of operation of ultra-sonic blood flow meter. (7)

OR

- IV. a. Explain principle of operation of piezo-electric arterial pulse receptors. (8)
b. Explain principle of operation of electromagnetic blood flow meter. (7)

UNIT – II

- V. a. Describe the block diagram of an EMG machine. (8)
b. List and explain different electrodes used for EEG measurement. (7)

OR

- VI. a. Explain bipolar limb lead systems of ECG with neat figure. (8)
b. Explain the block diagram of ECG. (7)

UNIT- III

- VII. a. Describe the operation of ventricular synchronous demand pacemaker. (8)
b. Illustrate the working of hemodialysis machine. (7)

OR

- VIII. a. Explain the working of Ultrasonic diathermy unit. (8)
b. List the advantages and disadvantages of short wave diathermy. (7)

UNIT - IV

- IX. a. Describe the operation of CAT scanner with a block diagram. (8)
b. Explain the block diagram of ultrasonic imaging system. (7)

OR

- X. a. Describe the working principle of nuclear magnetic resonance imaging system. (8)
b. Write a short note on tele-medicine. (7)
