

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2024**

BIOMEDICAL INSTRUMENTS

(Maximum Marks:100)

(Time: 3 Hours)

PART - A

(Maximum Marks : 10)

Marks

- I. Answer **all** the questions in one or two sentences. Each question carries 2 marks.
1. Define Bioelectricity.
 2. List any two types of electrodes used for ECG measurement.
 3. State the need of ventilator.
 4. Define Micro shock.
 5. Name the frequency regions of EEG waveform. (5 x 2 = 10)

PART - B

(Maximum Marks: 30)

- II Answer **any five** questions from the following. Each question carries 6 marks.
1. Explain the working principle of photo electric pulse transducer.
 2. Describe the process of recording EEG with the help of a block diagram.
 3. List any four functions of haemodialysis machine.
 4. Explain the block diagram of a Bio telemetry system.
 5. Draw a typical ECG waveform and explain its different parts.
 6. List the criteria for selecting biomedical transducers.
 7. Classify different types of pacemakers. (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 working principle of piezo electric arterial pulse receptor. (8)

- (b) Explain the direct method of blood pressure measurement. (7)

OR

- IV (a) Explain the working principle of strain gauge type respiration sensor. (8)
(b) Explain the working principle of ultrasonic blood flow meter. (7)

UNIT – II

- V (a) Explain the 10-20 electrode lead system for EEG measurement. (9)
(b) Explain the different types of electrodes used for EEG measurement. (6)

OR

- VI (a) Explain the different types of electrodes used for EMG measurement. (6)
(b) Describe the block diagram of an ECG machine. (9)

UNIT – III

- VII (a) Explain the working of an AC defibrillator. (9)
(b) Compare the implantable pacemakers and external pacemakers. (6)

OR

- VIII (a) Explain the working of Short wave diathermy unit. (8)
(b) Explain the working of electrical conductivity blood cell counter. (7)

UNIT – IV

- IX (a) With the help of block diagram describe the working principle of NMR imaging system (8)
(b) List the electrical safety considerations with respect to machine operators and patients. (7)

OR

- X (a) With neat block diagram explain the construction and working of an X-ray machine. (8)
(b) List the precautions to be taken while handling biomedical instruments. (7)
