

FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY — OCTOBER, 2016

BIOMEDICAL INSTRUMENTS

(Common to EI and IT)

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Define Bio electric potential.
2. What is LVDT ?
3. Sketch the avl lead system.
4. What is lateral measurement in EEG ?
5. What is Biotelemetry ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer *any five* questions from the following. Each question carries 6 marks.

1. Describe the operation of LVDT for pressure measurement.
2. Describe the working principle of optical fibre temperature sensor.
3. Draw the Electrocardiogram, indicate its amplitude and duration and state their importance.
4. What are the classifications of EEG frequency bands.
5. What are the basic requirements of an implantable pacemaker ?
6. What are the different ways in which the pulses are delivered in an external pacemaker ?
7. Explain the working principle of CAT scanner.

(5×6 = 30)

PART — C

(Maximum marks : 60)

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

UNIT — I

- III (a) What are the different types of electrodes used for ECG measurement ?
Explain in brief. 8
- (b) Describe a variable capacitance pressure transducer. 7

OR

- IV (a) Explain the principle of operation of Ultrasonic Doppler shift flow velocity meter. 8
- (b) Describe any one method of direct blood pressure measurement. 7

UNIT — II

- V (a) List the types of electrodes used and their arrangement while monitoring EEG. 8
- (b) Draw the building block of ECG and explain. 7

OR

- VI (a) Draw the block diagram set up for EMG recording and explain 10
- (b) Sketch the different unipolar limb lead connections. 5

UNIT — III

- VII (a) Explain with block diagram ventricular synchronous demand pacemaker. 8
- (b) Explain with schematic diagram a D.C. Defibrillator. 7

OR

- VIII (a) What are the different methods of blood cell counting. 8
- (b) Draw the schematic diagram of microwave diathermy unit and explain its working. 7

UNIT — IV

- IX (a) How are X-rays produced ? Draw the construction and operation of an X-ray machine with a block diagram. 10
- (b) What are the properties of ultrasonic waves ? 5

OR

- X (a) Draw the block diagram of biotelemetry system and explain. 8
- (b) State the precautions to be taken while handling biomedical equipments. 7