

Total Pages—3

(Set-Q<sub>1</sub>)

**M.Tech-1st(EE - C & I)**  
**Biomedical Instrumentation**

*Full Marks : 70*

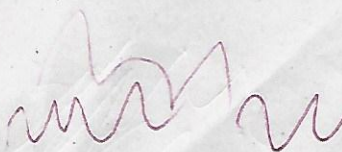
*Time : 3 hours*

Answer any six questions including Q. No. 1  
which is compulsory

*The figures in the right-hand margin indicate marks*

1. Answer the following questions : 2 × 10
- (a) Identify two types of transducers. Give examples.
  - (b) What do you understand by the term impedance?
  - (c) What is ECG? How is it generated in wave form?
  - (d) Identify the clinical difference between lead and view.
  - (e) Describe electrodeless method of measuring impedance.

( Turn Over )

 ( 2 )

✓ (f) Graphically show the relationship between impedance change (in ohms per litre of air breathed in) versus body weight.

(g) List the components of respiratory equipment.

(h) What is EEG ? What are the applications of EEG ?

(i) What is the frequency range of ultrasound waves ?

(j) Identify the main differences between X-ray and CT scan.

2. (a) Describe the phases of action potential profiles with waveform. 5

(b) With block diagram describe the construction of an action potential measuring device. 5

✓ 3. (a) Describe the essential characteristics of voltage measuring device. Justify your answer by giving suitable examples. 5

✓ (b) What do you mean by loading of a source ? How does loading of the source affect voltage measurement ? 5



( 3 )

4. (a) Visible light has wavelength range of 400-700 nm. What is the corresponding frequency range ? 5
- (b) What is the corresponding energy range ? 5
5. Write short notes on : 5 + 5
- (i) Piezoelectric transducer
- (ii) Supported metal microelectrodes.
6. (a) Name three implantable electrodes for defecting biopotential. 5
- (b) Define half-cell potential. 5
7. (a) Define sensor and transducer. Write the difference between sensor and transducer. 5
- (b) Define polarisable electrodes. Explain that the Ag/AgCl electrode is a practical electrode is a perfectly non-polarisable electrode. 5
8. (a) Name different body surface electrodes. 5
- (b) Discuss on any one of them with application. 5