

Time: 3 hours

Marks: 80

N.B.:

- (1) Question number 1 is compulsory.
- (2) Attempt any three questions from the remaining five questions.
- (3) Figures to the right indicate full marks.
- (4) Draw suitable graphs/diagrams wherever necessary.

- Q1** Answer any four: **20**
- a) Sketch and explain the working method of portable blood glucose monitor
 - b) Justify the need of unipolar and bipolar leads in ECG recording.
 - c) Enlist and explain the methods of removing the mains 50Hz noise from Biopotentials.
 - d) Draw and explain the method of skin resistance measurement.
 - e) Draw and explain resting Cell membrane potential.
- Q2** a) What are motion artefacts? What is the source of them in ECG recording? **05**
- b) What is specific about pacemaker cells of heart. **05**
- c) What are the methods to reduce noise due to high frequency sources? **05**
- d) Why is it desirable to record the biopotentials with differential amplifiers? **05**
- Q3a** With the help of suitable illustrations explain the circuits for input protection in ECG. **7**
- Q3b** Explain ECG 12 lead system with suitable sketches. **6**
- Q3c** With the help of sketches, explain the different components of EEG present at different conditions of subject's alertness. **7**
- Q4a** Explain the significance of multiplexing in biotelemetry systems? **10**
- Q4b** Explain the differences between Microshock and macroshock **10**
- Q5a** Explain the ultrasound based foetal heart rate monitor. **10**
- Q5b** Explain the need of baby incubator for neonates. Also, provide the details of necessary protection system for the same. **10**
- Q6** Write short notes on any four of the following: **20**
- a. Cardiac Arrhythmia
 - b. electrodes used in EMG
 - c. EOG measurement
 - d. Biopotential amplifier
 - e. Apnoea detector.
