

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) Explain the cell membrane potential in absence of stimulus.
 - b) Explain the design criteria of a point of care device to be used at a remote place.
 - c) Compare and contrast the unipolar and bipolar lead techniques in Biopotential recording
 - d) Explain the different noises observed while recording biosignals.
 - e) What is the significance of skin resistance measurement?
- Q2** a) Explain the skin electrode interface. Also, correlate it to describe the generation of the motion artefacts. 05
- b) What will be the effect of increased level of potassium on cardiac cells? 05
- c) Why is it desirable to record the biopotentials with differential amplifiers? 05
- d) What are the methods to reduce 50 Hz mains frequency noise? 05
- Q3a** With the help of suitable illustrations explain the significance of right leg drive circuit in ECG recorder. 7
- Q3b** Enlist and explain ECG 12 lead system with placement of electrodes. 6
- Q3c** With the help of sketches, explain the different components of EEG present at different conditions of brain. 7
- Q4a** With suitable block diagram and sketches, explain the significance of time and frequency division multiplexing in biotelemetry system. 10
- Q4b** Define and explain "Cardiac Arrhythmia" with the help of neat block diagram of the system used for its recording. 10
- Q5a** Explain abdominal foetal ECG based fetal heart rate monitor. 10
- Q5b** Explain the construction of Baby incubator with suitable sketches. 10
- Q6** Write short notes on any four of the following: 20
- a. Microshock and macroshock
 - b. EOG measurement
 - c. Wilsons Lead selection network
 - d. Phonocardiogram
 - e. Apnoea detector.
