

(3 Hours)

[Total Marks : 100

- N. B. :
- (1) Question No. 1 is **compulsory**.
 - (2) Attempt any **four** questions out of remaining **six** questions.
 - (3) Figures to the **right** indicate **full** marks.
 - (4) Assume **suitable** data wherever **necessary**.
 - (5) Draw sketches / diagrams wherever **necessary**.
 - (6) Use **legible** handwriting. Use **blue/black** ink.

1. (a) Explain in details using suitable diagram and waveform, how nerve action potential is generated. [10]
- (b) Draw the placement of ECG electrodes in Bipolar and Unipolar configuration including chest electrodes. [10]
2. (a) Explain using neat circuit diagrams the following: [10]
 - (i) RL driven circuit
 - (ii) Protection circuit
- (b) using suitable diagrams explain the working of the following: [10]
 - (i) Inkjet recorder
 - (ii) Thermal array recorder.
3. (a) Explain using suitable diagram 10/20 electrode system of EEG [10]
- (b) Explain how various waves of EEG can be filtered [10]
4. (a) Draw and explain the block diagram of ECG transmitter. [10]
- (b) Explain and explain the circuit diagram of temperature monitoring [10]
5. (a) What are microshock and macroshock hazards ? Explain the current limits to avoid it. [10]
- (b) Explain using suitable block diagram bedside monitor [10]
6. (a) Explain using suitable diagram ultrasonic FHR system [10]
- (b) Draw and explain block diagram of Apnea detector. [10]
7. Write short notes on : (Any Four) [20]
 - (a) ECG electrodes
 - (b) EMG biofeedback
 - (c) Wilson network
 - (d) Touch screen panels
 - (e) Impedance plethysmography