

22436

23124

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
  - (2) Illustrate your answers with neat sketches wherever necessary.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :**

**10**

- (a) List the technical specification of pulse oxymeter (any four).
- (b) Explain use of following diagnostic equipments :
  - (i) Sphygmomanometer
  - (ii) Impedance audiometer
- (c) List technical specification of heart rate meter.
- (d) State the concept of speech audiometer.
- (e) Give normal values of amplitudes and duration of 'P' wave used for ECG machine.
- (f) State ranges of following parameters in case of pure tone audiometer :
  - (i) Frequency range in Hz.
  - (ii) Signal intensity range in dB.
- (g) List following signal characteristics of Electroencephalograph (EEG).
  - (i) Frequency range
  - (ii) Signal amplitude



- 2. Attempt any THREE of the following : 12**
- (a) Differentiate between direct & indirect blood pressure measurement techniques.
  - (b) Draw & explain Wilson's network in ECG machine.
  - (c) Explain concept of Vectocardiography.
  - (d) Draw block diagram of Pure tone audiometer & describe it.
- 3. Attempt any THREE of the following : 12**
- (a) The basic frequency of EEG range is classified into four bands. State range of following bands :
    - (i) Delta wave
    - (ii) Theta wave
    - (iii) Alpha wave
    - (iv) Beta wave
  - (b) Mention any four possible faults which can occur in EEG machine and give its solution to rectify it.
  - (c) Compare ECG and PCG.
  - (d) Draw and explain block diagram of Ultrasonic FHR meter.
- 4. Attempt any THREE of the following : 12**
- (a) Draw block diagram of ECG machine & explain it.
  - (b) Draw block diagram of respiration rate meter & explain it.
  - (c) Describe sensory and motor nerve conduction with suitable diagram.
  - (d) Draw figure of 10-20 method of EEG electrodes & list them.
  - (e) Draw block diagram of phonocardiograph & explain its working.

**5. Attempt any TWO of the following :****12**

- (a) An ECG machine is received with following problems. State remedies to eliminate it :
- (i) Machine is totally dead
  - (ii) ECG trace too dark
  - (iii) ECG signal is noisy.
  - (iv) ECG trace too light
  - (v) ECG baseline is shifting
  - (vi) ECG trace not available.
- (b) Choose the instrument used to study electrical activity in brain. Give its principle of operation with neat diagram.
- (c) State use of GSR (Galvanic Skin Reflex) meter. Draw the block diagram and explain principle of operation of GSR meter.

**6. Attempt any TWO of the following :****12**

- (a) Draw unipolar, bipolar and average electrode system for EEG recording.
- (b) Draw block diagram of heart rate meter & explain it.
- (c) Define the term blood pressure. Draw the block diagram of sphygmomanometer & explain it.
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