

22436

12425

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.

**Marks**

**1. Attempt any FIVE :**

**10**

- (a) Give application of
  - (i) Audiometer
  - (ii) GSR meter
- (b) Draw blood-pressure waveform & label it with systole & diastole, also mention correct pressure of systole & diastole.
- (c) List tech specifications of Heart Rate meter (any 4)
- (d) Alpha & Beta wave of EEG are responsible for which activity of human ?
- (e) Briefly classify blood pressure measurement tech.
- (f) List any 4 respiratory parameters.
- (g) Suggest the instrument for measuring lung capacity.

**2. Attempt any THREE :**

**12**

- (a) With neat diagram give generation process of ECG signal.



- (b) With neat labelled diagram give working principle of spirometer. List application of spirometer.
- (c) Elaborate concept of air & bone conduction.
- (d) Differentiate between Direct & Indirect BP measurement tech. (any 4 point)

**3. Attempt any THREE :**

**12**

- (a) Suggest & draw the block diagram for instrument which is used to measure the heart beat of baby in mother's womb.
- (b) Draw labelled diagram of EEG machine.
- (c) Draw labelled diagram of digital hearing aid & give function of each block.
- (d) With neat diagram (waveform) show relationship between Blood-pressure heart sound & ECG.

**4. Attempt any THREE :**

**12**

- (a) Suggest specific application of the following :
  - (1) Speech audiometer
  - (2) Impedance audiometer
  - (3) Pure tone audiometer
  - (4) Evoked response audiometer
- (b) Give concept of motor & sensory nerve conduction.
- (c) With neat diagram give significance of heart sound & it's origin. Name the instrument to measure heart sound.
- (d) Draw labelled block-diagram of EEG machine.
- (e) List any 3 methods of calculation of Heart rate. Calculate the heart rate if duration between two successive 'R' wave is 0.8 sec.

**5. Attempt any TWO :****12**

- (a) With neat diagram give concept of 'Einthoven' triangle method & state it is used for calculation of which parameter of human being.
- (b) With neat diagram explain operating principle of pulse oximeter.
- (c) Explain generation of EEG signal. List all waves with frequency & also list significance of each wave.

**6. Attempt any TWO :****12**

- (a) Define Maintenance. List types of Maintenance.  
Give troubleshooting process for following faults occurs in EEG m/c.
    - (1) EEG m/c does not start.
    - (2) Black-line on EEG graph
    - (3) Paper (EEG graph paper) does not move
    - (4) EEG signal does not pick-up
  - (b) State types of temperature. Suggest the diagnostic equipment to measure digitally temp. Draw labelled block-diagram & give function of each block.
  - (c) For protecting the patient from shock hazards in ECG m/c, which circuit is used ? Draw the labelled diagram of same.
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