

17545

11920

3 Hours / 100 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.

Marks

1. (A) Attempt any THREE :

12

- (a) Draw blood pressure waveform and define following terms :
 - (i) Systolic Blood pressure
 - (ii) Dichrotic Notch
- (b) Explain Beer and Lamberts law.
- (c) State the concept of vector cardiography.
- (d) Illustrate following methods to measure the heart rate :
 - (i) Average
 - (ii) Bit to bit

(B) Attempt any ONE :

6

- (a) State and draw Einthoven's triangle of potential difference across heart. Also show bipolar lead configuration.
- (b) Define EEG. Explain with neat sketch of preamplifier circuit of EEG.

2. Attempt any FOUR :**16**

- (a) Draw and describe operation of digital blood pressure meter in detail.
- (b) List four technical specifications of respiration rate meter.
- (c) Explain principle of operation of pure tone audiometer.
- (d) Explain with neat circuit diagram of right leg drive circuit.
- (e) Describe the generation of EMG signal.
- (f) Draw block diagram of PCG machine and describe its working.

3. Attempt any FOUR :**16**

- (a) Differentiate between direct and indirect blood pressure measurement technique.
- (b) Draw a neat labelled diagram of heart rate meter and give its working in brief.
- (c) List any four technical specification of EEG machine.
- (d) Enlist technical specification of phonocardiograph.
- (e) Draw unipolar limb lead configuration in ECG.

4. (A) Attempt any THREE :**12**

- (a) Draw the diagram of spirometer and give its working principle.
- (b) Draw block diagram of Bekesy Audiometer. State function of each block.
- (c) List six unipolar chest leads and give their positions on body surface.
- (d) Give the procedure to measure motor nerve conduction velocity with suitable diagram.

(B) Attempt any ONE :**6**

- (a) An ECG machine is received with the following problems. State remedies to eliminate it.
- (i) ECG trace not available
 - (ii) ECG trace too light
 - (iii) ECG trace too dark
 - (iv) ECG baseline is shifting
 - (v) Machine is not getting switched on
 - (vi) ECG signal is noisy
- (b) Draw figure of 10-20 method of EEG electrode and list the electrodes.

5. Attempt any FOUR :**16**

- (a) Draw block diagram of digital temperature meter.
- (b) List four technical specification of spirometer.
- (c) Describe principle, operation of hearing aid.
- (d) Compare between ECG and PCG (any four).
- (e) Define following respiratory parameter :
- (i) The residual volume
 - (ii) Expiratory capacity
 - (iii) Inspiratory reserve volume
 - (iv) Vital Capacity
- (f) Draw block diagram of EMG machine and state the function of each block.

P.T.O.

6. Attempt any FOUR :**16**

- (a) Describe 1 mV calibration network in ECG machine with suitable diagram.
 - (b) Sketch the Ear response for conduction through air and conduction through bone.
 - (c) Explain block diagram of pulse oxymeter.
 - (d) Mention any four possible faults which can occur in EMG machine and give its solution to rectify it.
 - (e) What is audiometer ? List types of audiometer. Also explain speech audiometer.
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