



# 17545

**16172**

**3 Hours / 100 Marks**

Seat No.

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- Instructions :** (1) *All questions are compulsory.*  
(2) *Answer each next main question on a new page.*  
(3) *Illustrate your answers with neat sketches wherever necessary.*  
(4) *Figures to the right indicate full marks.*  
(5) *Assume suitable data, if necessary.*

**Marks**

1. A) Attempt **any three** : **12**
- a) Write technical specifications of digital blood pressure meter (any four).
  - b) Draw block diagram of pulse oxymeter and describe it.
  - c) Illustrate following methods to measure the heart rate :
    - i) Bit to bit
    - ii) Combination of bit to bit with average.
  - d) Describe the significance of vector-cardiography.
- B) Attempt **any one** : **6**
- a) Draw following circuits used in ECG machine and state their importance :
    - i) 1 mV calibration circuit
    - ii) Wilson network.
  - b) Suggest troubleshooting techniques for various faults in EEG machine.
2. Attempt **any four** : **16**
- a) Describe operation of digital blood pressure meter with suitable diagram.
  - b) Draw block diagram of ultrasonic FHR meter.
  - c) Give the importance of microphone, amplifier and earphone in hearing aid and suggest which type of deficiency of human body it can overcome.
  - d) Describe right leg drive circuit used in ECG machine with suitable diagram.
  - e) Describe sensory and motor nerve conduction.
  - f) Draw block diagram of PCG machine and describe it.
3. Attempt **any four** : **16**
- a) Differentiate between direct and indirect blood pressure measurement techniques (any four points).
  - b) Describe the concept of fetal heart rate.

**P.T.O.**



- c) Draw block diagram of EEG machine.
- d) How four sounds are produced by the heart ?
- e) Describe the generation of ECG signal.

**4. A) Attempt any three :**

**12**

- a) State effects of removing of comparator and monostable multivibrator from respiration rate meter.
- b) Draw block diagram of pure tone audiometer and state the function of each block.
- c) Draw block diagram of ECG machine and state function of each block.
- d) Describe generation of EMG signal.

**B) Attempt any one :**

**6**

- a) An ECG machine is received with the following problems. State remedies to eliminate it :
  - i) ECG trace too dark
  - ii) ECG trace too light
  - iii) ECG signal is noisy.
  - iv) ECG baseline is shifting.
  - v) ECG trace not available.
  - vi) Machine is not getting switched on.
- b) Draw unipolar, bipolar and average electrode system for EEG recording.

**5. Attempt any four :**

**16**

- a) List technical specifications of digital temperature indicator (any four).
- b) Describe spirometer with suitable diagram.
- c) Draw block diagram of GSR meter and describe it.
- d) Compare ECG with PCG.
- e) Define any four respiratory parameters.
- f) Draw block diagram of EMG machine and state function of each block.

**6. Attempt any four :**

**16**

- a) Write steps for maintenance of ECG machine.
- b) List technical specification of hearing aid.
- c) Describe the concept of systemic temperature and skin temperature.
- d) Mention any four possible faults which can occur in EMG machine and give its solution to rectify it.
- e) Describe the concept of impedance audiometer.