



17545

15116

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.*

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|---|--------------|
| 1. A) Attempt any three : | 12 |
| a) State concept of blood-pressure, with proper waveform. | |
| b) Draw labelled block diagram of digital temperature meter. | |
| c) Give different methods for calculation of heart rate. Describe any one. | |
| d) List four technical specifications of ECG machine. | |
| B) Attempt any one : | 6 |
| a) i) Draw labelled block-diagram of ECG Machine. | |
| ii) List the maintenance steps followed in ECG M/C. | |
| b) Describe generation of electroencephelography signal. Draw and explain pre-amplifier circuit of EEG Machine. | |
| 2. Attempt any four : | 16 |
| a) With neat diagram describe indirect method for BP measurement. | |
| b) Draw a neat labelled diagram of heart-rate meter and give its working in brief. | |
| c) With neat diagram describe principle of operation of GSR meter. | |
| d) Distinguish between ECG and PCG (04 Pt.) | |
| e) Give the procedure to measure sensory and motor nerve conduction velocity with suitable diagram. | |
| f) Give significance of heart sound. | |
| 3. Attempt any four : | 16 |
| a) Difference between direct and indirect method of BP measurement (04 Pt.) | |
| b) Describe ultrasonic FHR meter with neat diagram. | |
| c) State different recording technic in EEG Describe average recording technic. | |
| d) With neat diagram describe phonocardiography. | |
| e) List technical specifications of ECG Machine (any 04). | |

P.T.O.

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

12

- a) Give concept of heart rate and fetal heart rate also list the meter to measure the same.
- b) With neat diagram explain pure tone audiometer.
- c) With neat circuit diagram give working of 1mv. Calibration ckt. used in ECG Machine.
- d) Draw and explain pre-amp^r circuit of EMG Machine.

B) Attempt **any one** :

6

- a) Draw block diagram of EEG Machine of describe its operation.
- b) An ECG Machine is received with the following problems state the 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.

5. Attempt **any four** :

16

- a) List technical specification of :
 - i) Pulse oximeter.
 - ii) Digital temp-meter.
- b) List technical specifications of respiration rate meter and explain meaning of any two.
- c) Define in brief concept of Galvanic skin reflex. List four technical specification of meter used to measure the same.
- d) State significance of heart sounds in detail.
- e) Draw and explain block diagram of spirometer.
- f) How EMG signal is generated. Explain motor and sensory nerve conduction.

6. Attempt **any four** :

16

- a) Give and explain front pannel of ECG Machine.
 - b) i) List two technical specifications of hearing aid.
ii) Draw labelled block diagram of hearing aid.
 - c) State significance of SPO_2 in blood. Draw labelled diagram of pulse oximeter.
 - d) Draw a neat diagram of EMG Machine.
 - e) State the concept of speech audio-meter and impedance audiometer.
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