

22648

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.

**Marks**

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

**10**

- (a) Define the following w.r.t. lungs volume and capacities :
  - (i) Tidal volume
  - (ii) Inspiratory reserve volume
  - (iii) Expiratory reserve volume
  - (iv) Functional residual capacity
- (b) Name any two electrodes each used for measurement of :
  - (i) ECG
  - (ii) EEG
- (c) State the name one of each biomedical instrument used for measurement of following : (i) Blood flow (ii) Heart sounds.
- (d) Define Macro-Shock.
- (e) State any one application of each (i) X-ray (ii) CT Scanner.
- (f) Draw neat labelled diagram of a neuron.
- (g) State the name of any two valves present in heart.

**2. Attempt any THREE of the following :**

**12**

- (a) Explain mechanism of breathing.
- (b) Draw and explain block diagram of ECG machine.
- (c) Draw the block diagram of spirometer. Explain function of each block in brief.
- (d) Draw and explain the block diagram of internal pacemaker.



- 3. Attempt any THREE of the following : 12**
- (a) Draw a neat labelled diagram of Man-Instrument system. Explain function of each block in brief.
  - (b) Explain EEG system with neat block diagram.
  - (c) Draw block diagram of ultrasonic type of blood flow measurement. Explain its working in brief.
  - (d) Define : (i) Fibrillation (ii) Defibrillation.  
List the types of Defibrillator.
- 4. Attempt any THREE of the following : 12**
- (a) State any two functions of kidney. Explain operation of kidney in brief.
  - (b) Describe resting potential with neat labelled diagram.
  - (c) Draw and explain working of sphygmomanometer.
  - (d) Draw the block diagram of biotelemetry. Explain function of each block.
  - (e) State full form of SPECT. State any two of each :  
(i) application of SPECT (ii) Specifications of SPECT.
- 5. Attempt any TWO of the following : 12**
- (a) Describe the operation of cardiovascular system.
  - (b) Draw schematic diagram of electrode – electrolyte interface. Explain its working.
  - (c) Draw block diagram of X-Ray machine. Explain its working.
- 6. Attempt any TWO of the following : 12**
- (a) Draw block diagram of phonocardiograph. Explain function of each block.
  - (b) Draw block diagram of Hemodialysis machine. Explain its working.
  - (c) Describe A, B, M mode of ultrasonography with the help of waveform.
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