

17672

11718

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) Define Heart Block and state the meaning of Cardiac Arrhythmias.
- (b) Describe the concept of fibrillation of heart.
- (c) State four applications of ventilator.
- (d) Draw the neat labelled block diagram of programmable microprocessor based infusion pump.

(B) Attempt any ONE : 6

- (a) Describe any two types of dialyzers with suitable diagram.
- (b) Draw the block diagram of cardioverter. State the function of each block.

2. Attempt any FOUR : 16

- (a) State the types of pacemaker and explain the difference between Synchronous and Asynchronous. (any two points).

- (b) Draw neat diagram of Heart Lung Machine. State its application.
- (c) Explain any two modes of Ventilator.
- (d) Explain the concept of unipolar and bipolar bends.
- (e) List technical specification of central monitoring system. (any four)
- (f) Draw the circuit diagram of temperature control and indicator used in baby incubator and describe its working.

**3. Attempt any FOUR :****16**

- (a) A defibrillator delivers a square pulse of 400 volts with duration of 4 ms. The internal resistance of defibrillator is about 15 ohm. The skin electrode resistance is 50 ohm and thorax resistance is 30 ohm. Compute the energy delivered to the patients thorax and total energy available from the defibrillator.
- (b) Draw block diagram of synchronous pacemaker and state function of each block.
- (c) State the need of (i) nebulizers, (ii) suction apparatus (iii) Respirator, (iv) Anaesthesia apparatus.
- (d) In which condition central monitor is used ? Describe with diagram.
- (e) State the need of following machine :
  - (i) Haemodialysis machine
  - (ii) Heart Lung Machine

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

- (a) State the causes for following faults of bedside monitor :
  - (i) Temperature varies frequently
  - (ii) SPO<sub>2</sub> of pulse is not displayed.
  - (iii) ECG waveform displayed is improper.

(b) Give application area of the following electrodes :

- (i) endocardial leads
- (ii) myocardial leads
- (iii) unipolar leads
- (iv) bipolar leads.

(c) Draw a labelled diagram of suction apparatus.

(d) State the concept of respiration and apnea.

**(B) Attempt any ONE :**

**6**

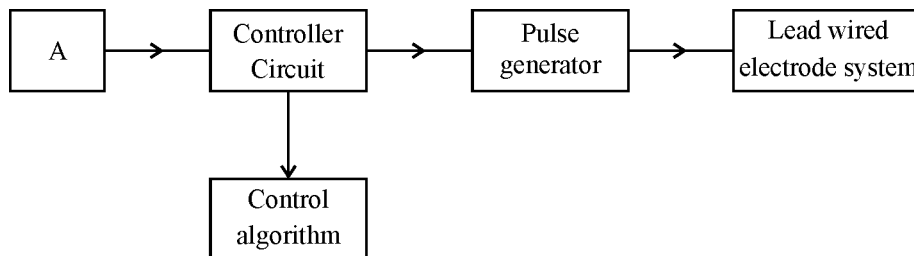
(a) State the troubleshooting procedure steps of defibrillator (any six points).

(b) State the need of (i) oxygenator, (ii) Heat exchanger and draw block diagram of Haemodialysis machine.

**5. Attempt any FOUR :**

**16**

(a) Name the fig B. Identify the missing block A. Give importance of block A.



**Fig. B**

(b) Differentiate between internal and external pacemaker.

(c) Give any four technical specification of DC Defibrillator.

(d) Draw a labelled diagram of Anaesthesia Machine.

(e) Draw block diagram of microprocessor based ventilator.

**P.T.O.**

**6. Attempt any FOUR :****16**

- (a) Give any four technical specification of boils apparatus.
  - (b) Draw block diagram of conventional method and closed loop control drug delivery system.
  - (c) Draw block diagram of baby incubator and describe it.
  - (d) A patient is required pacemaker for short time while operating him. Suggest type of pacemaker required for patient and draw the block diagram of pacemaker.
  - (e) State the need of artificial kidney (any four point).
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