

15162

3 Hours / 100 Marks

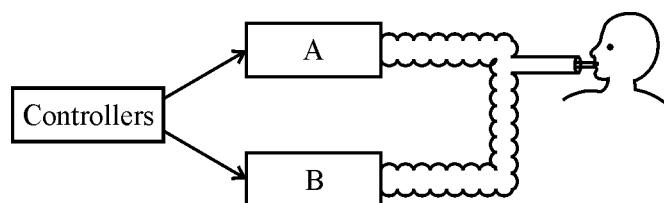
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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks**1. (A) Attempt any THREE :****12**

- (a) List the four types of leads used in pacemaker and explain any two of them.
- (b) State the meaning of fibrillation of heart and state the need of defibrillator.
- (c) Identify the Fig. A. Name the blocks A and B and state the function of blocks A and B.

**Fig. – A**

- (d) Draw and explain the block diagram of central monitoring system.

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

- (a) Draw the circuit diagram of charging and discharging sections of DC Defibrillator and explain both the sections.
- (b) Name the apparatus used to maintain environmental conditions suitable for a newborn baby. Draw block diagram for the apparatus and explain the principle of operation for it.

2. Attempt any FOUR : **16**

- (a) Differentiate between On-demand and Fixed rate pacemaker any two points of each.
- (b) Draw block diagram of Heart-Lung Machine and explain why Heart-lung Machine is called a “By-pass Machine”.
- (c) Define troubleshooting and state the troubleshooting steps carried out for ventilator.
- (d) State the purpose of Bedside Monitoring and Central Monitoring System.
- (e) Draw the circuit diagram of temperature controlled system used in baby incubator.
- (f) Draw the block diagram of Internal Pacemaker and state the meaning of asynchronous and synchronous pacemaker.

3. Attempt any FOUR : **16**

- (a) Draw and explain ventricular synchronous demand pacemaker.
- (b) Calculate the energy stored in a $16 \mu\text{F}$ capacitor that is charged to a potential of 5000 V dc.
- (c) State the concept of respiration and Apnea.
- (d) Classify the below given equipments into either ICU (Intensive Care Unit) equipment or OT (Operation Theatre) equipment :
 - (a) Anesthesia equipment
 - (b) Heart-lung machine
 - (c) Pacemaker
 - (d) Defibrillator machine
- (e) Draw and explain any two types of dialyzers.

4. (A) Attempt any THREE : 12

- (a) Differentiate between internal pacemaker and external pacemaker (any two points of each).
- (b) State the different modes of ventilator.
- (c) Draw the block diagram of bedside monitor and explain it.
- (d) State the concept of Suction apparatus and Anesthesia machine.

(B) Attempt any ONE : 6

- (a) The Defibrillator machine has following problems displayed on its monitor screen. Identify the cause and solution for it.

Problem	Cause	Solution
No paddles	?	?
Leads off	?	?
Low Battery	?	?

- (b) State the need of artificial kidney and draw the block diagram of haemodialysis machine.

5. Attempt any FOUR : 16

- (a) Name the figure B. Identify the missing block A and block B. Give the importance of block A and block B.

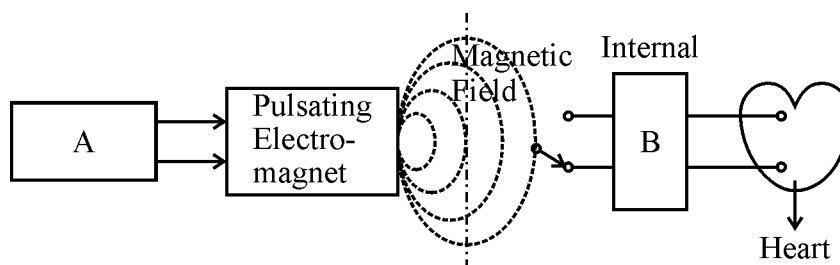


Fig. – B

- (b) Draw and explain block diagram of microprocessor based ventilator.
- (c) State the importance of infusion pump.
- (d) List the technical specifications of DC Defibrillator. (Any four)
- (e) List the possible faults of Haemodialysis machine and give their possible solution.
- (f) Write any four technical specifications of ventilator.

6. Attempt any FOUR :**16**

- (a) State the significance of Boils apparatus in Operation Theatre (O.T.) and draw the block diagram of it.
 - (b) A patient requires pacemaker for specific time while operating him. Suggest the type of pacemaker required for patient and draw the block diagram of pacemaker.
 - (c) List down any four important technical specifications for Baby Incubator machine.
 - (d) Draw the block diagram of drug delivery system and explain it.
 - (e) Write any four technical specifications of pacemaker.
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