

17672

21415

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.
(4) Assume suitable data, if necessary.

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|---|--------------|
| 1. (A) Attempt any THREE : | 12 |
| (a) Define following terms : | |
| (1) Cardiac arrhythmia | |
| (2) Tachycardia | |
| (3) Bradycardia | |
| (4) Heart block | |
| (b) Describe the concept of fibrillation of heart. | |
| (c) List the possible faults of ventilator and give their possible solution (any 4). | |
| (d) Draw a neat labelled block diagram of Bed-side monitor. | |
| (B) Attempt any ONE : | 06 |
| (a) Draw and describe circuit diagram of charging and discharging sections of DC – defibrillator. | |
| (b) Describe any two types of dialyzers with suitable diagram. | |
| 2. Attempt any FOUR : | 16 |
| (a) Differentiate between fixed and demand pacemaker (any 4 points). | |
| (b) State the need of following machines : | |
| (i) Hemodialysis machine | |
| (ii) Heart-lung machine | |

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- (c) Write the significance of following mode of ventilator :
 - (i) Assist mode
 - (ii) Control mode
- (d) List technical specifications of bed-side monitor (any 4).
- (e) Draw block diagram of heart-lung machine and describe its working.
- (f) Explain the concept of unipolar and bipolar leads.

3. Attempt any FOUR :

16

- (a) Describe rate responsive pacemaker with suitable diagram.
- (b) A defibrillator delivers a square pulse of 4 K 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 (30 Ω). Compute the energy deliver to the patients thorax and total energy available from the defibrillator.
- (c) List any four technical specifications of suction apparatus.
- (d) Draw block diagram of central monitor. State the need of it.
- (e) Draw a circuit diagram of temperature control and indicator used in baby incubator and describe its working.

4. (A) Attempt any THREE :

12

- (a) Differentiate between endocardial and myocardial pacemaker leads.
- (b) State the maintenance steps carried out for ventilator.
- (c) State the causes for following faults of bedside monitor.
 - (i) Temperature varies frequently
 - (ii) SpO₂ or pulse is not displayed
 - (iii) ECG wave displayed is improper
- (d) Draw a labelled block diagram of Nebulizer.

(B) Attempt any ONE :

06

- (a) List any four possible faults and its solution in defibrillator. Also give maintenance procedure for defibrillator.
- (b) Draw a neat block diagram of hemodialysis machine. List any 4 technical specifications of it.

5. Attempt any FOUR :**16**

- (a) Differentiate between internal and external pacemaker (any 4 points).
- (b) Describe the need of anesthesia machine.
- (c) Draw a block diagram of programmable microprocessor based infusion pump.
- (d) Give any 4 technical specifications of DC defibrillator.
- (e) Write different types of oxygenators and give its importance in heart-lung machine.
- (f) Describe the operation of suction apparatus with suitable diagram.

6. Attempt any FOUR :**16**

- (a) Describe fail safe system of anesthesia machine.
 - (b) A patient requires a pacemaker for a short time while operating him. Suggest the type of pacemaker required for patient. Draw a block diagram of it.
 - (c) Draw a block diagram of conventional method and closed loop control drug delivery system.
 - (d) Draw block diagram of baby incubator and describe it.
 - (e) Draw block diagram of a trial synchronous pacemaker and describe it.
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