



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (BME)/SEM-6/BME-601/2012

2012

THERAPEUTIC EQUIPMENTS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : $10 \times 1 = 10$

i) Which condition of heart is more dangerous ?

- a) Atrial fibrillation
- b) Ventricular fibrillation
- c) Temporary problem of heart
- d) None of these.

ii) Natural pacemaker is

- a) SA node
- b) AV node
- c) Bundle of his
- d) Purkinjee fibre.



- iii) Myocardial electrode is connected to the
- a) inner wall of the heart muscle
 - b) outer wall of the heart
 - c) inside the blood vessels
 - d) inside the lungs.
- iv) For mono-polar internal pacing electrode the cathode is placed at
- a) heart inside
 - b) heart outside
 - c) chest surface
 - d) none of these.
- v) For surgical diathermy the blended wave is used for
- a) cutting effect
 - b) coagulation
 - c) both cutting and coagulation
 - d) no sensation.
- vi) The chronaxie is
- a) twice the rheobase
 - b) same value of rheobase
 - c) thrice the rheobase
 - d) none of these.



- vii) Full form of TENS is
- a) terminal electrode for normal skin
 - b) the electro natural source
 - c) transcutaneous electrical nerve stimulation
 - d) none of these.
- viii) Phototherapy is used for the treatment of
- a) Jaundice
 - b) Fever
 - c) Pox
 - d) None of these.
- ix) In the defibrillator the capacitor used for discharge of pulse is
- a) polar
 - b) non-polar
 - c) both polar and non-polar
 - d) none of these.
- x) CO₂ lasers are mainly used in
- a) Neurosurgery
 - b) Lens capsule surgery
 - c) Glucoma
 - d) Dentistry.



GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Write the process for analysis of a pacing circuit with its algorithm.
3. Write the significance of strength duration curve in physiological systems.
4. Draw the block diagram of an anesthesia machine and explain in brief.
5. What are the different safety measures to be taken during electrosurgery ?
6. Why are AC defibrillators not used now-a-days ? Justify.
7. What do you mean by negative pressure ventilation and positive pressure ventilation ? Which method is used ?



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. What are the complications associated with implantable pacemaker ? What are the advantages of programmable pacemaker ? Describe the microprocessor based ventilator.

5 + 2 + 8

9. a) In a defibrillator the capacitor ($C = 100 \mu\text{F}$) has charged up to V (800 volt), then it discharged to the chest surface having load resistance R (100Ω). The output voltage delivered to the heart (V_h) is a function of time 't' and follow the relation $V_h(t) = Ve^{-t/RC}$. Find out the time required to short-circuit the capacitor by SCR so that it can delivered 25 Joule energy to the heart.

6

- b) Define cardioverter. Briefly discuss the function of cardioverter with block diagram.

1 + 5

- c) Draw the circuit diagram of peripheral nerve stimulator.

3



10. What do you mean by lithotripsy ? Describe the basic components for extracorporeal lithotripsy. Write the basic principle operation of LASER. 2 + 8 + 5

11. Define Rheobase and Chronaxie. What are the different types of muscle stimulators ? What do you mean by diaspulse therapy ? 4 + 8 + 3

12. a) With schematic diagram discuss the basic part of a ventilator. 5

b) With schematic diagram discuss the different electrodes used in a defibrillator. 5

c) Why is the Li-Iodide battery preferable for pacemaker than the other power sources ? 5



13. Write short notes on any *three* of the following : 3 × 5

- a) Shortwave diathermy
 - b) Application of argon laser
 - c) Phototherapy unit
 - d) Pacemaker nomenclature
 - e) Neonatal ventilator.
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