



Name :

Roll No. :

Invigilator's Signature :

**CS/B.Tech(BME)/SEM-6/BME-601/2011
2011**

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 × 1 = 10

- i) Argon laser is a
 - a) molecular laser
 - b) ionic laser
 - c) solid-state laser
 - d) dye laser.
- ii) The Chronaxie value of cardiac muscle is around
 - a) 0.2 mili sec
 - b) 2 mili sec
 - c) 0.08 mili sec
 - d) none of these.
- iii) For the pacemaker categorization VAT is
 - a) Value Added Tax
 - b) Ventricular sensing Atrial pacing Triggered mode
 - c) Atrial sensing Ventricular pacing Triggered mode
 - d) none of these.



- iv) SCR mean
 - a) Silicon Controlled Rectifier
 - b) Source for Current & Resistor
 - c) Silicon Controlled Resistor
 - d) Silicon Controlled Reactor.
- v) In defibrillation, spoon shaped electrodes are used in
 - a) Synchronized defibrillation
 - b) External defibrillators
 - c) Internal defibrillator
 - d) A.C. defibrillator.
- vi) In a capacitive type defibrillator, dual pulse is used to reduce required
 - a) energy
 - b) voltage
 - c) pulse duration
 - d) none of these.
- vii) In ventilator gas blending is done using
 - a) air and oxygen
 - b) only air
 - c) oxygen and nitrogen
 - d) none of these.
- viii) The gas mixture which is generally delivered during anesthesia is
 - a) nitrous oxide and oxygen
 - b) nitrous oxide and CO₂
 - c) nitrous oxide and argon
 - d) oxygen and nitrogen.



- ix) The suitable frequency range for ultrasonic therapy is
- a) 800 KHz – 1 MHz b) 1 MHz – 5 MHz
- c) 200 KHz – 500 KHz d) none of these.
- x) The mathematical form of energy stored in a capacitor is
- a) $\frac{1}{2} (CV^2)$ b) $\frac{1}{2} (CV^3)$
- c) $\frac{1}{2} (C^2V)$ d) $\frac{1}{2} (C^2V^2)$.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

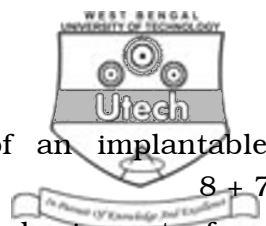
2. Give different types of pacing mode in a tree or table pattern.
3. Draw and discuss the different kinds of waveform used in a muscle stimulator.
4. Briefly explain the working principle of ND-YAG laser.
5. How is the induced voltage to the cardiac tissue related with the radius of the spherical pacing electrode ? Discuss with mathematical deduction.
6. Write the different methods of short wave diathermy.
7. Briefly discuss the different modes of application of an Artificial Pace Maker.

GROUP – C

(Long Answer Type Questions)

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

8. a) Explain the three main parameters used to describe a ventilation system.
- b) What is PEEP function ? $9 + 6$
9. a) Explain the 4-step process of laser generation.



- b) What are the essential features of an implantable pacemaker ? 8 + 7
10. a) With schematic diagram discuss the basic part of an anesthesia machine. 5
- b) Write the different power sources of an artificial pace maker. 5
- c) Find the resistivity in ohm-meter of an object whose volume is 0.6 m^3 , if an electrosurgery unit delivers 56 W and a line current of 600 mA. 5
11. a) How can you control the pulse width and pulse duration of a pacemaker ?
- b) Draw the circuit diagram with explanation of a dual peak delay line capacitor type defibrillator. Why is it more advantageous than a normal capacitive type defibrillator ?
- c) Draw and discuss the block diagram of an implantable defibrillator. $2 + (6 + 2) + 5$
12. a) Briefly discuss the different types of defibrillators used for cardiac defibrillation. 6
- b) Write the different methods for testing of an electro surgery machine. 5
- c) Draw the Strength-Duration Curve. Why is it very important for the physiological system ? 4
13. Write short notes on any *three* of the following : 3×5
- a) Electrosurgery safety
- b) CO_2 LASER formation
- c) Different Inspiratory and Expiratory Phase of Respiration
- d) Basic idea about a suction apparatus
- e) Baby incubator.