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**CS/B.Tech/BME(NEW)/SEM-6/BME-601/2013**

**2013**

# THERAPEUTIC EQUIPMENT

*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 frequency for short wave diathermy is

a) 26.12 MHz b) 27.12 MHz

c) 26.14 MHz d) 27.14 MHz.

iii) The pulse width of Nd-YAG laser is

a) 10-20 ns b) 20-30 ns

c) 30-40 ns d) none of these.

iv) The most commonly used pulse waveforms in stimulators are

a) 3 types b) 4 types

c) 5 types d) 6 types.

v) In defibrillation, spoon shaped electrodes are used in

a) Synchronized defibrillation

b) External defibrillators

c) Internal defibrillator

d) A.C. defibrillator.

vi) 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.

vii) Fibrillation of human heart is

a) one type b) two types

c) three types d) four types.

viii) The Chronaxie value of cardiac muscle is around

a) 0.2 ms b) 2 ms

c) 0.08 ms d) none of these.

ix) The suitable frequency range for ultrasonic therapy is

a) 800 kHz-1MHz b) 1MHz-5MHz

c) 200kHz-500kHz d) none of these.

x) The most suitable power source for a pacemaker is

a) Nuclear battery b) Mercury battery

c) Lithium battery d) Biological battery.

## GROUP – B
## ( Short Answer Type Questions )

Answer any *three* of the following. 3 × 5 = 15

2. Give different types of pacing mode in a tree or table pattern.

3. What are the different safety measures to be taken during eletrosurgery ?

4. Describe the operating principle of surgical diathermy.

5. Draw and discuss the different kinds of waveform used in a muscle stimulator.

6. Draw five different kinds of electrode for defibrillation.

7. Explain the operating principle of an implantable pacemaker.

## GROUP – C
## ( Long Answer Type Questions )

Answer any *three* of the following. 3 × 15 = 45

8. a) Explain the three main parameters used to describe a ventilation system.

b) What is PEEP function ? 9 + 6

9. a) With schematic diagram discuss the basic part of a anaesthesia machine.

b) Write the different power sources of an artificial pace maker.

c) Discuss about the basic principle of Gas-LASER action. 5 + 5 + 5

10. a) What is meant by electrosurgery machine ?

    b) Explain the basic operating principle of electrosurgery machine with block diagram.

    c) List three mechanisms by which accidental burning of a patient can occur.

    d) Find the resistivity in ohm-metre of an object whose volume is $0.6 m^3$, if an electrosurgery unit delivers 56 W and a line current of 600mA. 2 + 6 + 3 + 4

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 about the Coherency and Monochromacity properties of LASER.

    b) With block diagram discuss about the Microprocessor based Ventilator.

    c) What do you mean by Defibrillator System Analyzer ? Discuss. 5 + 5 + 5

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

    a) Short wave diathermy

    b) Peripheral nerve stimulator

    c) Baby incubator

    d) Arrythmia therapy using defibrillator

    e) Application of laser in biomedical field

    f) Ultrasonic lithotripter.