

Name :

Roll No. :

Invigilator's Signature :

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. $3 \times 5 = 15$

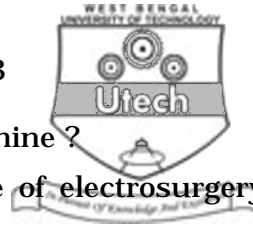
- 2. Give different types of pacing mode in a tree or table pattern.
- 3. What are the different safety measures to be taken during eletrosurgery ?
- 4. Describe the operating principle of surgical diathermy.
- 5. Draw and discuss the different kinds of waveform used in a muscle stimulator.
- 6. Draw 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. $3 \times 15 = 45$

- 8. a) Explain the three main parameters used to describe a ventilation system.
- b) What is PEEP function ? $9 + 6$
- 9. a) 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 0.6m^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 Monochromaticity 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) Arrhythmia therapy using defibrillator
e) Application of laser in biomedical field
f) Ultrasonic lithotripter.
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