Name :	Utech
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.

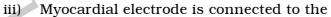
Candidates are required to give their answers in their own words as far as practicable.

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.

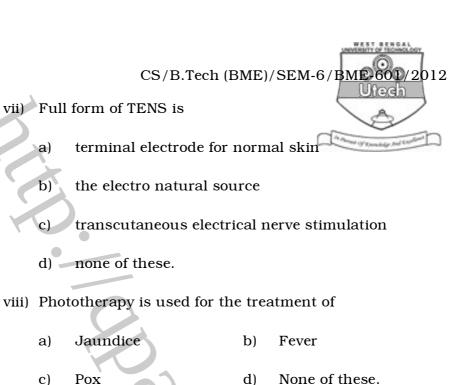
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- a) inner wall of the heart muscle
- b) outer wall of the heart
- c) inside the blood vessels
- d) inside the lungs.
- iv) For mono-polar internal pacing electrode the cathode is placed at
 - a) heart inside
- b) heart outside
- c) chest surface
- 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.



In the defibrillator the capacitor used for discharge of pulse is

polar a)

a)

c)

b) non-polar

Pox

- both polar and non-polar c)
- none of these. d)
- CO_2 lasers are mainly used in x)
 - Neurosurgery a)
 - Lens capsule surgery b)
 - Glucoma c)
 - d) Dentistry.

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GROUP - B

(Short Answer Type Questions)

Answer any three of the following.



- 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 ($C=100~\mu F$) has charged up to V ($800~{\rm volt}$), then it discharged to the chest surface having load resistance R ($100~\Omega$). The output voltage delivered to the heart $\left(V_h\right)$ is a function of time 't' and follow the relation $V_h\left(t\right)=Ve^{-t/RC}$. Find out the time required to short-circuit the capacitor by SCR so that it can delivered 25 Joule energy to the heart.
 - b) Define cardioverter. Briefly discuss the function of cardioverter with block diagram. 1+5
 - c) Draw the circuit diagram of peripheral nerve stimulator.

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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 diapulse therapy? 4+8+3

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



- 13. Write short notes on any *three* of the following :
 - a) Shortwave diathermy
 - b) Application of argon laser
 - c) Phototherapy unit
 - d) Pacemaker nomenclature
 - e) Neonatal ventilator.