

GANPAT UNIVERSITY
B.TECH. SEM. VIII BIOMEDICAL & INSTRUMENTATION ENGINEERING
REGULAR EXAMINATION MAY-JUNE 2012
BME 802 BIOMEDICAL INSTRUMENTATION II

TIME -: 3 Hours

TOTAL MARKS -: 70

Instructions:

1. All the questions are compulsory.
2. Answer of each section must be written in separate answer books.
3. Figure to the right indicate marks.
4. Assume data, if needed.
5. Conventional terms / notations are used.

Section – I

Que.1

- a). What is the advantage of defibrillator with synchroniser against defibrillator without Synchroniser? Explain defibrillator with synchroniser along with block diagram.
- b). Explain hollfiber type hemodialyser used in dialysis. What should be the design consideration of dialyser?

[12]

OR

Que.1.

- a). What is a defibrillator? What does a defibrillator do? What Are the Different Types of Defibrillator? Explain Capacitive discharge type DC defibrillator giving neat diagram.
- b). Explain Blood leak detector and Conductivity measurement unit in hemodialysis machine.

[12]

Que.2.

- a). What are basic requirements for implantable pacemaker? Enumerate different types of implantable pacemakers and explain Ventricular synchronous demand pacemaker giving neat block diagram.
- b). What is the LASER hazards associated with LASER surgery? Also Enumerate the safety precaution for that.

[11]

OR

Que.2

- a). Describe a ruby laser giving neat diagram and its use in retinal surgery.
- b). What are the performance aspects of implantable pacemaker? Explain in brief

[11]

Que.3.

- a). Which class of waveforms is preferred for defibrillation? Why?
- b). Discuss Internal Defibrillator Vs Pacemaker.
- c). What is the meaning of ICHD? What is the use of it?
- d). What do you mean by LASER and MASER? Enumerate different properties of LASER.
- e). What is the function of Kidney? What is peritoneal dialysis?
- f). Discuss about the various types of batteries used in Pacemaker.

[12]

Section – II

Que.4

- a). Draw and briefly explain schematic block diagram of anesthesia machine.
- b). Explain Microwave diathermy with suitable circuit diagram.

[12]

OR

Que.4

- a). Discuss safety aspects in electro surgical unit.
- b). Explain short-wave diathermy with its circuit diagram and applications.

[12]

Que.5

- a). Why humidification is needed in general anesthesia? Explain different methods.
- b). Compare different techniques of heating with reference to variations in skin and air temperature.

[11]

OR

Que.5

- a). Explain heat production and heat loss mechanism of infant.
- b). Explain principle of surgical diathermy with different modes of operation.

[11]

Que.6

- a). Calculate ultrasonic therapy dosage for superficial and chronic tissue with smaller treatment head. (consider application area double than probe)
- b). Draw and explain working of circuit interrupter for isolation purpose.
- c). Draw and explain schematic diagram for electro therapy stimulating unit.

[12]

-END OF PAPER-