

B.E/B.TECH (Full Time) DEGREE END SEMESTER EXAMINATIONS, APR/MAY 2012

Department of Electronics Engineering

VI Semester

EC9351 – MEDICAL ELECTRONICS

Time : 3 hours

Max. Marks: 100

Answer ALL questions

Part-A (10 x 2 = 20 marks)

1. Name the typical EEG signals and give its frequency bands.
2. What is a phonocardiograph? Name the four basic heart sounds in a phonocardiogram recording.
3. What is an auto analyzer? Give the basic elements of an auto analyzer.
4. Give the relationship between airway resistance and intra-alveolar pressure.
5. Distinguish between peritoneal dialysis and hemo dialysis.
6. What are the major blocks of a digital hearing aid and give its capabilities?
7. Give the basic requirements of a biotelemetry unit and mention its application.
8. What is the use of a ground fault interrupter?
9. What are the current applications in telemedicine?
10. Give the characteristics of lasers used in medicine.

Part-B (5 x 16 = 80 marks)

11. (i) Discuss the block diagram of a solid state electro surgery unit. List its advantages and disadvantages. (8)
(ii) With neat block diagram explain the thermography unit. How is the sensitivity of thermographic imaging system evaluated? (8)
12. a) (i) Discuss in detail any two types of electrodes used to measure bioelectric events. (8)
(ii) Explain any one type of bio-amplifier with neat diagram. (8)
(Or)
b) (i) Discuss in detail the origin of bio-potentials with necessary diagrams. (8)
(ii) Explain about the recording of EMG and EOG signals. (8)
13. a) (i) With neat diagram, explain the working of a magnetic and Ultrasonic blood flow meters. (12)
(ii) Explain the blood flow measurement using indicator dilution methods. (4)
(Or)
b) Explain about the pH and PCO₂ electrodes. Derive the relationship between pH and PCO₂. (16)

14. a) (i) With respect to defibrillator, draw the following waveform: Dual peak monophasic defibrillator discharge waveform and Truncated defibrillator discharge waveform. (8)
- (ii) Draw the basic circuit diagram of a capacitive discharge type of cardiac defibrillator and explain the working principle? (8)

(Or)

- b) With neat diagram, explain the working of a heart-lung machine. (16)

15. a) (i) Briefly explain the two pain control theory. Explain about the spinal cord stimulation system. (12)
- (ii) Write short notes on Electrical safety in medical environment. (4)

(Or)

- b) Explain about any two type of diathermies and give their applications. (16)