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ANNA UNIVERSITY CHENNAI: CHENNAI 600 025

Department of Electronics and Communication Engineering

B.E./B.Tech (Full time)–End Semester Examinations–Nov/Dec 2013

EC9351– Medical Electronics Semester: 6 R 2004/R2008

Time: 3 Hrs

Answer all Questions

Max. Marks: 100

PART – A

(10 x 2 = 20 marks)

1. Draw a typical cell potential waveform and define the various terms in it.
2. Mention the biopotential electrodes used for the measurement of biosignals like ECG, EMG, PCG and EEG.
3. State the important characteristics of a transducers and also mention the transducer used for measurement of blood pressure, heart rate, respiration rate and cardiac output.
4. Draw the schematic diagram of a multichannel photometer and state its significance.
5. Define a Pacemaker? Mention the different types of pacemaker with neat block diagram.
6. What is the principle of dialysis in the artificial kidney?
7. Give the significance of short wave diathermy unit under medical treatment with neat diagrams.
8. State few applications of radio-pill and bio-telemetry?
9. Draw the different types of waveforms generated by surgical diathermy unit and state its specifications.
10. What are cryogenics? List few applications

PART-B

(5 x 16 = 80 marks)

11. Draw the Einthoven triangle and explain the various types of lead connections with typical ECG waveforms.
- 12a. Explain any one method in detail to measure cardiac output, Blood pressure and blood cell counter with neat diagrams.
OR
- 12bi. Explain the principle of working of electromagnetic blood flow meter.
 - ii. Discuss the electrodes used for blood gas analyzers like pH, pO₂, pCO₂, and pHCO₃ measurements.
- 13ai. What is a defibrillators? Discuss the working principle of different types of Defibrillators with neat diagrams.
 - ii. Draw the schematic diagram of a heart- lung machine and discuss the various parameters of it.**OR**
- 13bi. With neat diagram discuss the principle of haemodialysis machine and also specify the performance of analysis of dialyzers.
 - ii. With neat diagrams discuss the working of Cochlear Implants of the human ear.
- 14a. With neat block diagram explain the diagnostic / therapeutic stimulating unit and its advantages.
OR
- 14b. With neat diagrams explain the precautions to minimize electrical shock hazard for electro medical equipment and suggest any one method to overcome it.

P.T.O.

15a. Explain the principle of operation of a Thermograph unit and its applications.

OR

15b. Draw the block diagram of a typical telemedicine system and discuss the concepts and it's essential parameters for telemedicine.
