


SIXTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)
END SEMESTER EXAMINATIONS APRIL/MAY 2017
SUBJECT: BIOMEDICAL INSTRUMENTATION [ICE 322]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** questions.
- ❖ Draw labeled diagram wherever necessary.

- 1A.** Normally resting membrane potential is negative in various cells. What is the reason behind it? How we can generate the action potential? **5**
- 1B.** Describe the problems encountered in measurement of physiological system. Explain how these differ from physical systems. **3**
- 1C.** With a neat diagram, define the term 'Synapse'. **2**
- 2A.** How heart lung machine can be used in open heart surgery? With a neat diagram, explain the working of heart lung machine and peristaltic pump **5**
- 2B.** What do you understand by 'Fibrillation'? Explain any one type of defibrillators with associated circuitry and waveforms. **3**
- 2C.** Differentiate between external and internal defibrillator electrodes. (2 difference) **2**
- 3A.** Explain the extracorporeal and intracorporeal dialysis with a neat schematic diagram. **5**
- 3B.** What is oximetry? Write an explanatory note on methods available for oximetry. **3**
- 3C.** Mention differences between Demand type & Atrial Synchronous pacemaker **2**
- 4A.** Define "blood pressure". Describe blood pressure measurement by direct and indirect measurement method. **5**
- 4B.** Explain working principle of electromagnetic blood flow meter with suitable diagram. **3**
- 4C.** In an electro- surgical unit, if power dissipation in 0.2 m^3 of tissue is 41.6 W , then calculate the current density. Assume tissue resistivity as $1.6 \times 10^3 \Omega\text{m}$. **2**
- 5A.** Justify that MRI is superior to any other imaging systems. Explain how longitudinal magnetization is developed in MRI? **5**
- 5B.** Describe principle of computerized Axial Tomography and compare it with conventional X-Ray imaging system. **3**
- 5C.** List the major differences between the fluoroscopy and radiography. **2**
- 6A.** Briefly explain the different modes of ultrasonic scanning with suitable diagrams. **5**
- 6B.** Name any six endoscopes and their applications in the medical field. **3**
- 6C.** List two advantages and disadvantages of lithotripsy. **2**