

Code: EC5T6FE3

III B.Tech - I Semester – Regular Examinations – November 2015

**BIO MEDICAL INSTRUMENTATION
(ELECTRONICS AND COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. a) Draw the block diagram of a MAN-Instrumentation system and explain its components. 10 M
b) What are the problems encountered in measuring a living system? Discuss. 4 M
2. a) Derive Nernst Equation for membrane potential. 8 M
b) Explain the propagation of Action Potentials through a Nerve. 6 M
3. a) Draw and explain the equivalent circuit of an Electrode-Electrolyte interface. 7 M
b) Explain the three basic types of Electrodes used for measurement of Bio-electric Potential. 7 M

4. Explain the Cardiac Cycle and show the relation between the Heart's pumping cycle and Its Electrical Activity. 14 M
5. a) What is the Einthoven Triangle? Discuss the three lead system Einthoven had developed with the help of neat diagrams. 10 M
- b) Draw an Electrocardiogram (in lead II) for a normal person and label the important waveforms with their amplitude and time duration. 4 M
6. a) Explain the function of pacemaker and why it is used? 4 M
- b) Draw and explain a simplified circuit diagram of a Shortwave Diathermy unit. 10 M
7. a) Draw the block diagram of a typical EMG recording setup and discuss the functions of each block. 8 M
- b) Explain the applications of EMG measurement in diagnosis and Therapy. 6 M
8. a) Define all the Static and Dynamic Respiratory parameters with the help of a graph. 10 M
- b) List out the various methods of measuring FRC (Functional Residual Capacity). 4 M