

B.Tech Degree VIII Semester Examination, April 2010

EC/EE 804 (D) BIOMEDICAL INSTRUMENTATION (2002 Scheme)

Time: 3 Hours

Maximum Marks: 100

- I. (a) What are 'bioelectric potentials'? Make a comparison of bioelectric potentials vis-à-vis electric potentials. Name atleast three types of biopotential sources from human body. (7)
- (b) Explain in detail about resting and action potentials with neat diagrams. Also include explanations about refractory periods. Draw the amplitude Vs time graph for the same. (13)
- OR**
- II. (a) Explain in detail about the electrodes used for ECG measurements with suitable diagrams. (15)
- (b) Draw a typical ECG waveform. Mark the various segments in it, with their corresponding typical values of amplitude and time. (5)
- III. (a) Explain in detail about ECG machine, with its constituent building blocks, with the aid of a block diagram. (15)
- (b) What is the significance of tape recorder in a typical EMG recording process? (5)
- OR**
- IV. Explain the significance of recorders in bio-medical engineering. Draw and explain the operation of inkjet recorder and UV recorder. Compare the pros and cons of each type. (20)
- V. (a) Which part is referred to as the 'natural pacemaker' in human heart? Why is it called so? (4)
- (b) Explain in detail about the various external and implantable pacemakers with suitable diagrams. (16)
- OR**
- VI. (a) What is meant by 'Defibrillators'? Explain about various implantable defibrillators. How they aid in making the heart function normal? (15)
- (b) Briefly explain about an ultrasonic therapy unit with diagrams. (5)
- VII. (a) Discuss about the requirements of a real time ultrasonic imaging system. (10)
- (b) What is Thermography? What are its applications? Explain a typical thermographic equipment. (10)
- OR**
- VIII. (a) Explain about computed tomography. Compare and contrast its advantages with respect to conventional X-ray technique. (10)
- (b) Draw the block diagram of a conventional X-ray machine. Explain the function of each block. (10)
- IX. (a) What are the different modulation systems used in wireless telemetry for transmitting biomedical signals. (10)
- (b) Give detailed discussion about the technique of transmission of analog physiological signals over telephone lines. (10)
- OR**
- X. (a) Explain in detail about a single channel telemetry system, citing the example of a typical ECG telemetry system. (10)
- (b) Discuss in detail about implantable telemetry systems. Cite the example of implantable telemetry system for ECG. (10)

