

Code No: 07A80403

**R07**

**Set No. 2**

**IV B.Tech II Semester Examinations, APRIL 2011**

**BIO-MEDICAL INSTRUMENTATION**

**Electronics And Communication Engineering**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions**

**All Questions carry equal marks**

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1. (a) What is a bio-amplifier? Describe the important features of a bio-amplifier.  
(b) What are the requirements of Bioelectric amplifiers. [8+8]
2. (a) Explain the characteristics of a cell.  
(b) Explain about polarized cell with resting potential and depolarized cell during an action potential. Explain how action potentials are propagated through the cell. [6+10]
3. (a) Give the salient features of needle electrodes. Give their applications.  
(b) List out various bio medical electrodes and give their applications. [8+8]
4. (a) With a neat sketch explain about the electrical activities of the heart  
(b) With a neat block diagram explain about cardiovascular circulation. [8+8]
5. Mention the principle of parallel plate dialyser. Explain in detail a Kill dialyser. [16]
6. (a) Draw a diagram of standard ECG giving nomenclature of the deflections and intervals. What is the importance of T-wave ?  
(b) Write a brief note on PR interval. [8+8]
7. (a) Discuss the high frequency oscillatory ventilation.  
(b) Explain how oxygen in blood can be estimated in ventilators. [8+8]
8. Do electric signals in the brain exist? What is a central nervous system? What is EEG? Describe how it can be obtained. [8+8]

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**R07****Set No. 4**

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BIO-MEDICAL INSTRUMENTATION

Electronics And Communication Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

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1. Explain human muscle system. Discuss in details with the blocks diagram, the working of an EMG machine. [8+8]
2. (a) Draw ECG waveform and correlate with electrical and mechanical activity of the heart.  
(b) Draw amplifier circuits of ECG machine incorporating various controls and explain how they function. [8+8]
3. (a) With neat sketches describe a cardiac cycle.  
(b) Explain in detail about physiology of heart. [8+8]
4. (a) Explain the electro physiology of a nerve and explain how an impulse is transmitted from nerve to muscle.  
(b) Explain the generation of bio- electric potentials associated with the muscles of the heart. [10+6]
5. (a) With an example, explain the importance of an isolation amplifier in biomedical instrumentation.  
(b) What are chopper amplifiers ? Draw a non mechanical chopper amplifier and explain its working. [8+8]
6. (a) What is deionizer? How is it useful for the treatment of city water?  
(b) What is acetate and bicarbonate dialysis? Discuss about the advantages and disadvantages. [8+8]
7. (a) Discuss about various types of Bio chemical electrodes and give their applications.  
(b) Distinguish between external and internal electrodes and give some examples [8+8]
8. (a) Explain the principle of operation of high frequency positive pressure ventilation.  
(b) Briefly discuss about the various gas transport mechanisms that can be used with ventilators. [8+8]

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**R07****Set No. 1**

IV B.Tech II Semester Examinations, APRIL 2011

BIO-MEDICAL INSTRUMENTATION

Electronics And Communication Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

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1. With the help of a neat diagram, explain the operation of a DC-delay line defibrillator. [16]
2. (a) Discuss in detail about cardiovascular circulation with the help of its block diagram  
(b) Describe the electrical activities of the heart. [8+8]
3. Explain the principle of operation of pneumotachograph. [16]
4. (a) Give the constructional details of micro electrodes and body surface electrodes.  
(b) What are the various sources of errors in measuring body potentials using bio electrodes. [8+8]
5. (a) Discuss the operation of ultrasonic blood flow meter .  
(b) Explain why reflectance type is preferred than transmittance type. [8+8]
6. (a) Discuss in detail about static characteristics of medical instruments.  
(b) With a neat circuit diagram explain the principle of operation of an instrumentation amplifier. Also derive the expression for voltage gain (AV) of an instrumentation amplifier. [6+10]
7. (a) Describe the propagation of action potential in a cell, nerve fibers, heart muscle.  
(b) List out the various types of Biopotentials originated from the Human body and brief any two with suitable figures of signals generated from them. [8+8]
8. (a) Discuss the design steps involved for EMG amplifiers.  
(b) Draw a neat block schematic of EMG recording system and explain its operation. [8+8]

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**R07****Set No. 3****IV B.Tech II Semester Examinations, APRIL 2011****BIO-MEDICAL INSTRUMENTATION****Electronics And Communication Engineering****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

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1. (a) Discuss the Cardio - Vascular Circulation with the help of a neat diagram  
(b) Deduce the relations between electrical and mechanical activities of the heart. [8+8]
2. (a) With a neat sketch explain the generation of action potentials.  
(b) List out different bio electric potentials.  
(c) Explain how bio electric potentials are measured. [6+5+5]
3. What are the different types of artificial kidneys? Draw the diagram of artificial kidney and label different parts. [8+8]
4. (a) Explain the gas transport model and the basic mechanical unit of the pulmonary System.  
(b) Write a short note on resuscitation bags. [8+8]
5. Explain the process of generation of EMG signal in the muscles. What type of information is obtained from EMG signals? Briefly explain the procedure of recording of surface EMG potential. [16]
6. (a) With neat diagrams, explain the importance of chopper amplifiers in biomedical Instrumentation .  
(b) Explain briefly about the need of following amplifiers in Bio-medical instrumentation.  
i. Bridge voltage amplifier  
ii. Buffer amplifier  
iii. Current amplifier [7+9]
7. (a) Draw a typical ECG signal indicating the amplitude values and various timings.  
(b) Explain the operation of isolation amplifier commonly used in modern ECG machine, with the help of a schematic diagram. [8+8]
8. (a) Draw the electrical equivalent circuit of a micro electrode and explain its working principle.  
(b) Discuss about electrical equivalent circuit of a electrode- electrolyte interface and discuss about the interpretation of each element. [8+8]

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