

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017

**BIO-MEDICAL INSTRUMENTATION**  
(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- What is Bio potential? Name various types of bio potential sources.
  - What are the properties of cell membrane action potential?
  - Define systole and diastole.
  - What do you by Seebeck and Peltier effects?
  - Define MVV, FVC, and FRC.
  - Define Micro shock and Macro shock.
  - What are the differences between Hemodialysis and Peritoneal dialysis?
  - Define nuclear magnetic resonance signal.
  - What is meant by therapeutic effect of heat?
  - What are the advantages diathermies?

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)

**UNIT – I**

- 2 (a) Explain the way in which a neuronal spike is evoked and transmitted from one neuron to another neuron.  
(b) Explain the working of Piezoelectric transducer as arterial pressure sensor.

**OR**

- 3 (a) What are the salient features of needle electrodes? Explain how it functions.  
(b) What are the characteristic features to be considered while selecting a transducer?

**UNIT – II**

- 4 (a) Explain with neat sketch, anatomy and conducting system of heart.  
(b) Describe the 10-20 lead system used in EEG and also explain the procedure to record the EEG signal.

**OR**

- 5 (a) With a neat block diagram, explain the salient features of ICCU.  
(b) What are the special features of phonocardiography?

**UNIT – III**

- 6 (a) Draw diagrams illustrating the process of respiration and circulation.  
(b) Explain different elements involved in Biotelemetry circuits.

**OR**

- 7 (a) Explain with relevant equations the working of Plethysmography.  
(b) Describe in detail the various ways used to induce the macroshocks.

**UNIT – IV**

- 8 (a) What are the advantages of using Lasers in medicine?  
(b) Explain the working principle of angiography in detail.

**OR**

- 9 (a) Explain the principle and working of CT scanning system.  
(b) Write a note on nuclear imaging technique with suitable diagrams.

**UNIT – V**

- 10 (a) With necessary equations, explain how urea concentration is reduced by the haemodialyser in each pass.  
(b) With the help of a neat block diagram, explain the working of a Cardioverter

**OR**

- 11 (a) Draw the block diagram of a short wave diathermy unit and explain its function.  
(b) State the need for defibrillator and explain its working.

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