26-11-2016 (FN)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60534

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Seventh Semester

Electrical and Electronics Engineering

EI 2311/EI 65/10133 EI 606 — BIOMEDICAL INSTRUMENTATION

(Common to Sixth Semester Electronics and Instrumentation Engineering and Fifth Semester — Instrumentation and Control Engineering)

(Regulations 2008/2010)

(Also common to PTEI 2311 — Biomedical Instrumentation for B.E. (Part-Time) Sixth Semester – EEE – Regulations 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the characteristics of resting potential.

2. Define Seebeck effect.

3. What are the types of electrodes?

4. Mention some protective devices used against electrical hazards.

5. Define pH.

6. List the basic types of measurements made in pulmonary clinic.

7. What are the major aspects of NMR imaging which could cause health hazards?

8. What are the advantages of thermography over other imaging systems?

9. Classify pacemaker based on mode of application of stimulating pulses.

10. What is the need for ultra filtrate monitor circuit?

PART B — (5 × 16 = 80 marks)

11. (a) With neat block diagram, explain the working of medical instrumentation system. (16)

Or

(b) Draw the structure of a living cell and explain its constituents. (16)

12. (a) Explain the different types of surface electrodes and their uses with neat diagram. (16)

Or

(b) Draw the recording set up of ECG and explain its operation. (16)

13. (a) (i) With a suitable schematic diagram explain the function of spirometer. (8)

(ii) Explain the working principle of sphygmomanometer in measuring blood pressure. (8)

Or

(b) Explain the Fick's, method of measuring cardiac output and give the advantages of cardiac measurement. (16)

14. (a) With neat block diagram explain the components of MRI system. (16)

Or

(b) Explain IR thermography and its instrumentation with suitable block diagram. (16)

15. (a) Explain internal and external defibrillators, in external defibrillators explain any three. (16)

Or

(b) (i) Compare hemodialysis and peritoneal dialysis. (6)

(ii) Explain the operation of peritoneal dialysis with suitable diagram. (10)