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

Question Paper Code : 51534

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 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)

(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 ranges of variation of human cells in diameter and in length.
2. Name any three types of physiological systems of human body.
3. Draw the normal waveform of an ECG for one cardiac cycle indicating the various segments.
4. What is the cause for the occurrence of Gross shock in Electrical safety of medical environment ?
5. Give the two values of blood pressure using direct method.
6. What is the use of body plethysmograph ?
7. Give any two types of medical Imaging devices.
8. Compare two types of patient monitoring systems.
9. What is fibrillation ?
10. What is meant by diathermy ?

PART – B (5 × 16 = 80 Marks)

11. (a) Explain the term "Resting potential" of the cell in the body. Describe with a figure the cross section of a cell with its resting potential. **(4 + 12)**

OR

(b) Explain with a diagram depicting the structure of the heart in the cardio vascular system with briefly on one method ECG measurement. **(8 + 8)**

12. (a) (i) What is the purpose of electrodes ? Name the two types of electrodes used in practice. **(4 + 2)**

(ii) Explain with a neat circuit diagram the chopper - stabilized operational amplifier in medical Electronics. **(5 + 5)**

13. (a) (i) Briefly describe the distribution and diffusion measurements with regard to pulmonary function. **(2 + 2)**

(ii) What is the use of spirometer ? Explain with a diagram the construction and working of classic water-sealed spirometer. **(2 + 4 + 6)**

OR

(b) (i) Explain the automated digital blood gas analyser. **(6)**

(ii) Define the process of diffusion. Explain the chemical analysis method of measurement for the determination of the amount of diffusion. **(4 + 6)**

14. (a) Explain with a block diagram the working of a basic X-ray machine. **(8 + 8)**

OR

(b) Describe with a block schematic the microprocessor - based bedside patient monitoring instrument. **(8 + 8)**

15. (a) (i) Briefly the term 'Ventilators". **(4)**

(ii) What are the advantages of DC defibrillators over AC defibrillators ? Describe with a circuit the working of a DC defibrillator. **(4 + 4 + 4)**

OR

(b) What is meant by dialysis ? Explain with a simplified block diagram the construction of a dialyser. **(4 + 6 + 6)**