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

Question Paper Code : 71803

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Seventh Semester

Electrical and Electronics Engineering

EI 6704 — BIOMEDICAL INSTRUMENTATION

(Common to Electronics and Instrumentation Engineering, Instrumentation and Control Engineering)

(Regulations 2013)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are resting potentials and action potentials?

2. Name the components of biomedical system.

3. What is meant by Mean Arterial Pressure (MAP)?

4. Mention the use of spirometer.

5. What is the need for bio-signal amplifier?

6. Draw the standard ECG waveform. Also mark the regions in the waveform.

7. List some of the applications of Bio-telemetry.

8. What is echo ophthalmoscope?

9. Differentiate peritoneal dialysis and hemodialysis.

10. What are the requirements of oxygenator?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the cardiovascular system and respiratory system with necessary diagram. (10)

(ii) Briefly explain the criteria's for selecting transducers for biomedical applications. (6)

Or

(b) (i) Explain briefly bio mechanics of bones and soft tissues. (8)

(ii) Explain the different techniques used for measuring human body temperature. (8)

12. (a) (i) What is cardiac output? Explain in detail any one method used for cardiac output measurement. (8)

(ii) What are the causes of heart sounds and how they are related to the function of cardiovascular system? (8)

Or

(b) (i) Explain in detail the measurement of $pO2, pCO_2$ blood. (8)

(ii) What is ESR and GSR? Explain the techniques used to measure them. (8)

13. (a) (i) What are chopper amplifiers? Mention their importance in Biomedical Instrumentation. Explain the working of Non-mechanical chopper amplifier with necessary diagram. (8)

(ii) Explain briefly the types of surface electrodes. (8)

Or

(b) (i) Explain in detail 10-20 electrode used in EEG recording. (8)

(ii) Discuss about the tests to be carried out to ensure safety of medical equipments. (8)

14. (a) (i) Discuss in detail about the basic components of a multichannel biotelemetly CL system. (6)

(ii) Explain computed tomography imaging technique and state its applications. (10)

Or

(b) Explain the principle and properties of Ultrasound Explain different modes of Ultrasound used in medical diagnostics. Also explain different types of US scan display. (16)

15. (a) (i) Explain the working of DC defibrillator with a neat block diagram. (8)

(ii) Explain in detail about shortwave and Microwave Diathermy Unit. (8)

Or

(b) (i) Explain Briefly ICCU Patient Monitoring System. (8)

(ii) Write short notes on Audiometer. (8)
