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

Question Paper Code : 41013

B.E./B.Tech DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Seventh Semester

Computer and Communication Engineering

OEC 754 – MEDICAL ELECTRONICS

(Common to B.E Computer Science and Engineering/B.Tech Information Technology)

(Regulations 2017)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Summarize the electrode and the types of electrodes used in the bipolar measurement.
2. Mention the characteristics of the EMG signal.
3. Define stroke volume of heart.
4. How is the respiration rate measured?
5. Compare the internal and external pacemakers.
6. Classify the different types of dialyzer.
7. Recall the different elements in biochemistry.
8. What do you mean by diathermy?
9. State the meaning of the term radio pill.
10. What are the disadvantages using an insulin pump?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Construct the characteristics of EMG signal with typical waveform. (8)

(ii) Formulate the list and discuss about the essential features of the bio amplifier. (5)

Or

(b) (i) Summarize the generation of PCG signals and discuss the measurement of PCG. (6)

(ii) Express the importance of 12 lead systems in ECG. (7)

12. (a) List and identify the principle of operation of blood cell counter types and its applications. (13)

Or

(b) (i) Analyze the PCO_2 measurement of blood pH value. (7)

(ii) Illustrate the CO_2 measurement principle with necessary diagram. (6)

13. (a) (i) What is pacemaker? What are different types of pacemaker? (6)

(ii) Analyze the working of synchronized dc defibrillator. (7)

Or

(b) Summarize key points about the working and types of dialyzers. (13)

14. (a) (i) Enumerate the salient features of microwave diathermy. (6)

(ii) Illustrate the block diagram of short wave and ultrasonic diathermy and explain. (7)

Or

(b) (i) Evaluate the operation of ultrasonic therapy using a block diagram. (8)

(ii) What are the benefits of employing ultrasonic therapy for therapeutic purposes? (5)

15. (a) Summarize the need for each of the essential components in an endomicroscope and its applications. (13)

Or

(b) Discuss the design procedure involved in the BMI (Brain Machine Interface) with neat diagram. (13)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Describe the processors for the typical setup of EEG with diagram. (7)

(ii) Develop the EEG waveform in details and its signal frequency bands. (8)

Or

(b) Evaluate the biotelemetry application on the WIMAX network using the appropriate diagrams. (15)