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Question Paper Code : 10512

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fifth Semester

Electronics and Communication Engineering

EC 8073 – MEDICAL ELECTRONICS

(Common to: Electronics and Telecommunication Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the characteristics needed for a bioamplifier.
2. List the characteristics of EMG recorder.
3. What is the purpose of Oxygenators in Heart Lung Machine?
4. What is Colorimeter? State its use.
5. List the basic components involved in Medical Instrumentation System.
6. Draw the waveform used in DC defibrillator.
7. List the advantages of biotelemetry.
8. List the applications of ultrasonic diathermy.
9. Write the functions of brain-machine interface.
10. What is the instrumentation behind insulin pump?

PART B — (5 × 13 = 65 marks)

11. (a) With neat diagram, explain how the electrical activity of the heart is measured. Also explain the various resultant waveforms and its abnormalities. (6+7)

Or

- (b) Explain the various types of bio-potential electrodes.

12. (a) How is the fraction of systolic pressure over diastolic pressure measured? Explain with necessary diagrams.

Or

- (b) What are the various techniques used to determine the quantity of blood cells? Explain.

13. (a) What is the function of a pacemaker with respect to cardiac health, and explain how does it operate within the body to regulate rhythms?

Or

- (b) What is the role of a hemodialyzer in treating kidney-related conditions, and explain how does it function to filter blood in patients undergoing dialysis?

14. (a) Explain in detail the various processes involved in Surgical diathermy and Microwave diathermy.

Or

- (b) Explain the parameters, operational modes and electrodes used in short wave diathermy.

15. (a) Explain the necessity and working of a radio pill. Discuss the applications of endo-microscopy unit. (9+4)

Or

- (b) How has telemedicine technology evolved over the years, and what are the driving factors behind its growth? How has the COVID-19 pandemic impacted the adoption and use of telemedicine technology?

PART C — (1 × 15 = 15 marks)

16. (a) Explain the basic principle behind thermography. What was the history that served behind thermography? Explain the thermographic equipment served for the purpose in detail. (5+5+5)

Or

- (b) Explain how Fick's method is used to measure the cardiac output. Discuss in detail about the types of bio-potential electrodes. (7+8)