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**Question Paper Code : 70403**

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

Sixth Semester

Electronics and Communication Engineering

EC 6001 – MEDICAL ELECTRONICS

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define absolute and relative refractory period.
2. Mention the cause of first and second heart sounds.
3. Define cardiac output.
4. State Beer's law.
5. Write down the advantages of DC defibrillator over AC defibrillator.
6. What is dialysate? Mention its composition.
7. List the devices used to protect against electrical hazards.
8. What does the term fulguration refer to?
9. How cryogenics is applied in medicine?
10. Mention few applications of laser in medicine.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the genesis of ECG and explain the working of an ECG machine with suitable block diagram along with its various lead configurations. (13)

Or

- (b) What is known as biopotential electrodes? Draw its equivalent circuit. Explain various types of biopotential electrodes with suitable diagram. (13)

12. (a) Explain in detail about thermo dilution and dye dilution of cardiac output measurement technique. (13)

Or

- (b) Describe in detail about the working principle of electromagnetic type blood flow meter. (13)

13. (a) (i) With a neat diagram explain the block diagram of DC defibrillator. (7)

- (ii) Describe the working of a trial synchronous pacemaker. (6)

Or

- (b) Explain in detail the different types of oxygenators and pumps used in heart lung machine. (13)

14. (a) Explain the following :

- (i) Short-wave diathermy. (6)

- (ii) Microwave diathermy. (7)

Or

- (b) (i) What is radio pill? (5)

- (ii) Draw the block diagram of single channel ECG telemetry system and explain the components. (8)

15. (a) Explain in detail about :

- (i) Thermography (7)

- (ii) Endoscopy. (6)

Or

- (b) Explain about the evolution and technologies involved in telemedicine. Discuss the application areas of telemedicine. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Compare the signal characteristics of ECG, EEG, EMG and PCG. (15)

Or

- (b) What is the need of electrical safety in hospital? Discuss the various physiological effects of electricity. (15)