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Q 2184

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Electronics and Communication Engineering

EC 041 — MEDICAL ELECTRONICS

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write down the Nernst Equation.
2. What are 'Cardiac output' and 'Phonocardiogram'?
3. Define Mean Arterial Pressure.
4. State the use of Blood Flow Meters.
5. What is a Defibrillator?
6. Mention the different modes of operation of pacemakers.
7. What is meant by the term 'Diathermy'?
8. What are Medical Stimulators? Mention its use.
9. What is Surgical Diathermy?
10. What is Cryogenic technique? What is its advantage?

PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail the origin of various Bioelectric potentials with necessary diagrams. (16)

Or

- (b) Draw an Electrocardiogram waveform labeling the critical features. Include typical amplitude and time intervals for a normal person. With neat diagrams explain 12 lead system in ECG with suitable diagrams. (16)

12. (a) (i) Draw the block diagram of an Ultrasonic Blood flowmeter. (4)
(ii) Explain the method of measuring the velocity of blood flow using transit time principle and Doppler effect. (12)

Or

- (b) Explain the basic principle of the following Equipments and describe its working.
(i) Calorimeter. (8)
(ii) Flame Photometer. (8)
13. (a) (i) Mention the two different types of defibrillators based on electrode placement. (2)
(ii) Draw the block diagram of synchronized d.c defibrillator (cardiovert) and explain its working. (14)

Or

- (b) (i) Distinguish between Hemodialysis and Peritoneal Dialysis. (4)
(ii) Explain in detail the procedure for Peritoneal Dialysis with suitable block diagram. (12)
14. (a) (i) Draw and explain the different types of waveforms used in stimulators. (8)
(ii) Draw the block diagram of Peripheral nerve Stimulator and explain its working. (8)

Or

- (b) Explain a Single channel ECG Telemetry system with suitable block diagram. (16)
15. (a) Discuss the different applications of Lasers in medicine. (16)

Or

- (b) (i) Distinguish between microshock and macroshock. (4)
(ii) Mention the devices available to protect against electrical hazards. (3)
(iii) Explain the physiological effects of current at 50 Hz. (9)