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

B 2136

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Sixth Semester

Electronics and Communication Engineering

EC 041 — MEDICAL ELECTRONICS

(Common to Eighth Semester Mechatronics Engineering)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Draw a typical ECG waveform.

2. List out the characteristics for a biosignal amplifier.

3. Define cardiac output.

4. What is residual volume?

5. Find the dc potential across a $16\,\mu F$ capacitor of a defibrillator that is charged to store an energy of 400 Watts.

6. Distinguish between internal pacemakers and external pacemakers.

7. Mention applications of ultrasonic diathermy.

8. What is tele stimulation?

9. List out the advantages of LASER in surgery.

10. Differentiate between micro shock and macro shock.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various classifications of biopotential electrodes. (10)

(ii) Draw an action potential waveform. (2)

(iii) Define the terms absolute refractory period and conduction velocity. (4)

Or

(b) (i) Explain the working principle of an EEG recorder. (10)

(ii) Write short notes on Phonocardiography. (6)

12. (a) (i) Describe the working principle of a flane photometer. (8)

(ii) Explain working principle of an electromagnetic blood flow meter. (8)

Or

(b) (i) Discuss in detail about various lung volumes and lung capacities. (8)

(ii) Discuss an experimental set up to measure lung volumes and lung capacities. (8)

13. (a) Explain the working principle of an audiometer with a neat block diagram.

Or

(b) (i) Explain the principle of operation of a Hemo dialyser. (8)

(ii) What is a demand pacemaker? Discuss its working principle with a suitable block diagram. (8)

14. (a) (i) Explain the working principle of microwave diathermy unit. (10)

(ii) Define the terms fulguration, blending and coagulation. (6)

Or

(b) (i) Mention advantages of a Biotelemetry system. (4)

(ii) Draw and explain the working principle of a single channel telemetry system. (6)

(iii) List out common modulation schemes employed in a telemetry system. (6)

15. (a) (i) Mention the physiological effect of electric current on humans. (6)

(ii) Explain the working principle of an infrared thermography unit with a neat block diagram. (10)

Or

(b) (i) What is endoscopy? Mention their applications. (6)

(ii) Discuss in detail about ground fault interrupters and line isolation monitors. (10)