C 29181

Name..................................

Reg. No..............................

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION JUNE 2012

EC/EE 2K 705 (A) /PTEE 2K 703 (A)—BIOMEDICAL INSTRUMENTATION

Time : Three Hours

Maximum : 100 Marks

Part A

I. Answer all questions :

(a) Mention the draw backs of surface electrodes.

(b) Draw a typical ECG waveform.

(c) What is a Phono Cardiogram ?

(d) Calculate the velocity of blood flow in the blood vessel using the following data :

The velocity of ultrasonic waves in blood is 1500 m/s. Angle between direction of blood flow and the direction of the incident beam is about 30°. The doppler shift in frequency is about 231 Hz when the incident ultrasonic frequency is 2 MHz.

(e) List out the advantages of LASER in surgery.

(f) Define tidal volume and residual volume.

(g) Differentiate between Micro shock and Macro shock.

(h) List out the physiological effects of electric current on humans.

(8 × 5 = 40 marks)

Part B

Module I

II. (a) Explain in detail about resting and action potentials.

Or

(b) (i) Define half cell potential. What are polarisable and non polarisable electrodes ?

(6 marks)

(ii) Write short notes on Micro electrodes.

(9 marks)

Module II

III. (a) Explain the working principle of an ultrasonic blood flow meter.

Or

Turn over

(a) (i) Discuss the measurement of Cardiac output based on indicator dilution method.

(8 marks)

   (ii) Explain the working principle of a spirometer.   (7 marks)

Module III

IV. (a) What is a defibrillator ? Explain the working of a DC defibrillator with a neat circuit diagram.

(15 marks)

Or

(b) (i) Explain working of a shock wave lithotripsy with a neat block diagram.   (8 marks)

   (ii) Write short notes on infant incubators.   (7 marks)

Module IV

V. (a) Explain in detail about devices to protect against electrical hazards.   (15 marks)

Or

(b) Explain the working principle of a pH meter.   (15 marks)

[4 × 15 = 60 marks]