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IC—702 / EC—011

**B. TECH.**

SEVENTH SEMESTER EXAMINATION, 2003-2004

**BIO-MEDICAL ELECTRONICS**

Time : 3 Hours

Total Marks : 100

**Note :** Attempt ALL questions.1. Attempt any *FOUR* parts of the following :— (5×4=20)

- (a) Discuss the various objectives of a medical instrumentation system.
- (b) What are the various problems encountered in measuring a living system ? Explain ARTIFACTS.
- (c) What are the various effects of a transducer on various bio-medical measurements ?
- (d) Explain Resting & Action potentials.
- (e) What is EEG ? Why is it much more difficult to recognize than ECG ? How can certain characteristic EEG waveforms be related to Sleep ?
- (f) What are various sources of Electrode Potential ? State NERNST equation and explain its various coefficients.

2. Attempt any *FOUR* parts of the following :— (5×4=20)

- (a) What is Electrocardiography ? Discuss various characteristic features of ECG amplifiers.

- (b) Discuss about the Electrodes and Leads that are affixed to the body of the patient in order to record an electrocardiogram.
  - (c) Discuss two commonly used ECG recorders briefly.
  - (d) How can electrocardiography be used for stress testing ?
  - (e) Discuss an automated indirect method of blood pressure measurement.
  - (f) Explain the ultrasonic method of blood flow measurement.
3. Attempt any *TWO* parts of the following :— (10×2=20)
- (a) Explain the physiology of respiratory system. Discuss various parameters which are a function of individual's physical characteristics and condition of breathing mechanism.
  - (b) What are plethysmographs (PLETHYSMOGRAPHS) ? How can they be used for the measurement of intrathoracic pressures ? Explain the methods of airway resistance measurement.
  - (c) Discuss various respiratory therapy equipments. What are Nebulizers ? Explain the working principle of ultrasonic nebulizer (NEBULIZER).
4. Attempt any *TWO* parts of the following :— (10×2=20)
- (a) Explain the working principle of CT Scan with block diagram.
  - (b) What are the properties of Ultrasound ?

aktuatoronline.com Discuss the basic modes of transmission of ultrasound. aktuatoronline.com

- (c) Discuss various types of Ultrasonic Imaging. Explain its applications in OPHTHALMIC SCANS and ECHOENCEPHALOGRAPHY .

Attempt any *TWO* parts of the following :— (10×2=20)

- (a) Discuss various applications of Biotelemetry. Explain the working of a BIO-LINK PWM transmitting system.
- (b) How can telemetry be done for ECG measurements during exercise and from extended Coronary Care patients ?
- (c) What are physiological effects of electrical current ? Discuss various methods of accident prevention.

