

5E5026

Roll No. _____

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B. Tech. V Sem. (Main / Back) Exam., Dec. 2014
Electronics and Communication Engineering
5EC6.1 Biomedical Instrumentation

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. NIL

2. NIL

UNIT – I

Q. 1 Explain the physiology the engineering analogous and important parameters of measurement for the following human body subsystems:

(a) Neural system [8]

(b) Cardiovascular system [8]

OR

(a) Give the classification of transducers used for bio – medical applications. [8]

- (b) What are electrodes? Classify them and discuss the selection criteria for transducers & electrodes. [8]

UNIT – II

- Q. 2 (a) Explain the action and resting potentials with suitable diagram. Also explain the propagation of action potentials. [10]
- (b) What is an electroencephalogram (EEG)? What are various frequency bands present in an EEG? Give the condition for their generation. [6]

OR

- (a) Give the construction and working of a sphygmomanometer with the help of a block diagram. rtuonline.com [8]
- (b) Explain the working principle of magnetic blood flow meter with help of suitable block diagram. [8]

UNIT – III

- Q. 3 (a) Describe the hematology of blood. Explain the working of a Coulter model STKS type blood analyzer with the help of suitable diagram. [10]
- (b) Explain the construction and working of a Gas – Liquid Chromatograph with the help of block diagram. [6]

OR

- (a) Explain the optical methods of blood pH measurement used for continuous monitoring. [8]
- (b) What is Magnetic Resonance Imaging (MRI)? How it is done? Compare the MRI & CT techniques. [8]

UNIT – IV

- Q. 4 (a) What are physiological effects of electric current on human body? [6]
(b) What are cardiac pacemakers? Classify them in detail. [10]

OR

- (a) Describe with the help of block diagram, a multi channel biotelemetry system. [8]
(b) What is hemodialysis? Explain the working of an artificial kidney with the help of block diagram. [8]

UNIT – V

- Q. 5 (a) What is Ischemia? Discuss the ECG pattern of a patient suffering from Ischemia. [8]
(b) Describe the criteria for identification of cardiac disorders. [8]

OR

- (a) Explain the data acquisition and processing system used for patient monitoring. [6]
(b) Explain the clinical applications of following bio potentials:
(i) E M G [5]
(ii) E R G [5]

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