

6E6064

Roll No. _____

Total No of Pages: **2****n 6E6064****B. Tech. VI-Sem. (Main & Back) Exam., April/May-2016
Electronic Instrumentation & Control Engineering
6EI4A Biomedical Instrumentation****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks (Main & Back): 26****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 may 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. NIL2. NIL**UNIT-I**

- Q.1 (a) "Neurons are the primary cell that involved in information processing in the nervous system." Justify the statement. [8]
(b) Discuss various types of biopotential electrodes. Draw their equivalent circuit diagram. [4+4=8]

OR

- Q.1 (a) What is meant by pulmonary and systemic blood circulation? Explain with suitable diagram. [4+4=8]
(b) Explain the factors that influence the design and application of a medical instrument system. [8]

UNIT-II

- Q.2 (a) Explain the origin of electrocardiogram. How that ECG helps in providing medical care to patients. [4+4=8]
(b) Draw the blood pressure waveform during a cardiac cycle in left atrium and left Ventricle. Discuss any one method of blood pressure measurement. [4+4=8]

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OR

- Q.2 (a) Explain the working principle of electromyograph? Discuss the use of EMG amplifiers and integrator. [3+5=8]
- (b) Explain the following:
- (i) Working principle of plethysmography
- (ii) Origin of different heart sounds. [4+4=8]

UNIT-III

- Q.3 (a) Discuss the scheme for measurement of CO₂ concentration in blood. Explain its significance. [6+2+=8]
- (b) How isotopes are used in medical imaging systems. Describe an imaging technique in detail. [8]

OR

- Q.3 (a) Explain the working principle of spectrophotometer and its application in clinical laboratory. [8]
- (b) Discuss the working principle of MRI. Explain the operation of this system with relevant sketches. [4+4=8]

UNIT-IV

- Q.4 (a) Discuss the working of basic elements used in intensive care units for patient monitoring. [8]
- (b) Explain the working and short wave diathermy with suitable diagram. [8]

OR

- Q.4 (a) Discuss the various safety measures used for medical equipments. [8]
- (b) Explain the working of heart-lung machine. Discuss the role of instrumentation in it. [6+2=8]

UNIT-V

- Q.5 (a) Discuss various ECG abnormal patterns along with their identification criteria. [8]
- (b) Discuss some real time computer applications in medical field. [8]

OR

- Q.5 Explain the following (any two): [8+8=16]
- (a) Electrocardiographic patterns of ischemia
- (b) Ventricular enlargement
- (c) Clinical applications of EEG.
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