5E5026

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5E5026

B. Tech. V - Sem. (Back) Exam., Feb.-March - 2021
Electronics & Communication Engineering
5EC6.1A Biomedical Instrumentation

Time: 2 Hours **Maximum Marks: 48**

 Min. Passing Marks: 15

Instructions to Candidates:

Attempt three questions, selecting one question each from any three 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 (a) Explain how bio-electric potential is generated. Define resting and action potentials with neat diagrams. Also include explanation about refractory periods. [8]

(b) Explain various elements of central nervous system with a suitable diagram. [8]

OR

Q.1 (a) Describe the working of human blood circulation system with schematic diagram. [8]

(b) Explain in detail the electrodes used for ECG measurements with suitable diagrams. [8]

UNIT- II

Q.2 (a) Draw an ECG of normal person, labeling the critical features and explain the working of an ECG machine. [10]

(b) Give the characteristic of different heart sounds during phonocardiography. [6]

OR

Q.2 (a) Design and explain the 10-20 electrode system used in EEG. [8]

(b) Define blood pressure. Describe any indirect blood pressure measurement method in detail. [8]

UNIT- III

Q.3 (a) Describe principle for computerized axial tomography and compare it with conventional X-Ray imaging system. [8]

(b) Write short note on –

(i) Endoscopy [4]

(ii) Ultrasonography [4]

OR

Q.3 (a) Explain the working principle for measurement of partial pressure of oxygen and carbon dioxide in blood. [8]

(b) Write short note on -

(i) ESR measurement [4]

(ii) GSR measurement [4]

UNIT- IV

Q.4 (a) Explain a basic bio-telemetry system with suitable diagram along with its advantages and disadvantages. [8]

(b) With the help of block diagram of ventilator along with its accessories, explain its functioning. [8]

OR

Q.4 (a) Elaborate on the medical equipment maintenance and safety parameters in handling it. [8]

(b) What is pacemaker? Explain the functioning of synchronous pacemakers. [8]

UNIT- V

Q.5 (a) Explain the various abnormalities observed in ECG patterns. [8]

(b) Write short note on clinical applications of -

(i) EEG [4]

(ii) EMG bio-potentials [4]

OR

Q.5 (a) Explain the data acquisition and processing system for patient monitoring. [8]

(b) Write short note –

(i) Atrial abnormalities [4]

(ii) Ventricular abnormalities [4]
