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Question Paper Code: 53B04

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Biomedical Engineering

15UBM304 - BIOMEDICAL INSTRUMENTS

(Regulation 2015)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The voltage developed at the electrode-electrolyte interface is known as _____. CO1- R
(a) Action potential (b) Electrode potential
(c) Resting potential (d) Polarized potential
2. Electrodes make a transfer from the _____ in tissue to the electronic conduction which is necessary to make measurements. CO1- R
(a) Lectric conduction (b) Electronic conduction
(c) Ionic conduction (d) Impulsive conduction
3. An ECG monitor usually has a frequency response of 0.05 Hz to about ____ Hz. CO2- R
(a) 10 (b)100 (c)1000 (d) None of the above
4. In the case of EEG with unipolar leads, the potential of each electrode is measured with respect to _____. CO2- R
(a) Adjacent electrode (b) Indifferent electrode
(c) Forehead electrode (d) Ground
5. Which of the following circuit is used in amplifying a weak ECG signal? CO3- R
(a) Transformer circuit (b) Differential amplifier circuit
(c) Non-inverting amplifier circuit (d) PN diode circuit

6. For biomedical applications, the mostly used amplifier is_____. CO3- R
 (a) Single ended amplifier (b) Differential amplifier
 (c) Inverting operational amplifier (d) Chopper amplifier
7. The improper response time of the amplifier in the biomedical recorders_____. CO4- R
 (a) Delays the signals (b) Affects the gain of the amplifier
 (c) Changes the shape of the wave of the signal (d) Attenuates the signals
8. Blood flow can be measured using the electromagnetic principles CO4- R
 because blood has a high_____.
 (a) Magnetic induction (b) Electrical resistivity
 (c) Electrical conductivity (d) Impedance
9. Which of the following medical instrument is used by doctors to CO5- R
 measure the blood pressure?
 (a) Barometer (b) Thermometer (c) Sphygmomanometer (d) Reflex hammer
10. The concentration of sodium, potassium and calcium ions in blood is CO5- R
 determined by_____.
 (a) Flame photometry (b) pH meter (c) Blood gas analyzer (d) Spectrophotometer

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Describe the different way of transport of ions through the cell CO1-U (8)
 membrane.
12. Explain the 12 lead ECG systems along with waveforms and its features. CO2-U (8)
13. Draw the block diagram of an ECG isolation amplifier and explain its CO3-U (8)
 working.
14. Discuss in detail about indirect methods of blood pressure measuring. CO4-U (8)
15. Explain the working of a blood gas analyzer with a neat sketch. CO5- U (8)