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Question Paper Code: 53B04

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Biomedical Engineering

15UBM304 - BIOMEDICAL INSTRUMENTS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The voltage developed at an electrode – electrolyte interface is termed as _____ CO1- R
 - (a) Resting Potential
 - (b) Half Cell Potential
 - (c) Evoked Potential
 - (d) Action Potential
2. Glass micropipettes and metal electrodes belongs to the type CO1- U
 - (a) Surface electrodes
 - (b) Needle electrodes
 - (c) Micro electrodes
 - (d) None of the above
3. EMG potentials are used to _____ CO2- R
 - (a) Differential Amplifier
 - (b) Isolation Amplifier
 - (c) Chopper Amplifier
 - (d) Bio - Amplifier
4. _____ is the science of recording and interpreting the electrical activity of muscle's action potential. CO2- R
 - (a) EMG
 - (b) ECG
 - (c) EOG
 - (d) ERG
5. _____ is the change in gain or DC – offset due to the thermal effects on the components of the amplifier circuit. CO3- R
 - (a) Noise
 - (b) Drift
 - (c) Chopper
 - (d) Bio - Amplifier
6. _____ is the device that passes frequency within a certain range and rejects frequencies outside that range. CO3-R
 - (a) Band-pass filter
 - (b) Isolation amplifiers
 - (c) Transformer
 - (d) None of the above

7. If the force in a system under pressure is not varied, then the pressure is known as _____ CO4- R
- (a) Hydrodynamic Pressure (b) Hydrostatic Pressure
(c) Intra thoracic Pressure (d) Cardiac Output
8. _____ is the product of the Heart Rate (HR), or the number of heart beats per minute (bpm) and the Stroke Volume (SV). CO4- U
- (a) Cardiac output (b) Blood flow (c) Pressure Output (d) Oxygen flow
9. Red blood cells is also known as _____ CO5- U
- (a) Leucocytes (b) Erythrocytes (c) Thrombocytes (d) Hemoglobin
10. _____ is used to measure blood chemistry and display that on a graphic recorder. CO5R
- (a) Blood Flow Measurement (b) Auto Analyzer
(c) Flame Photometer (d) Spectro Photometer

PART – B (5 x 2= 10Marks)

11. What are the characteristics of resting potential? CO1- U
12. What are the different types of lead systems of ECG? CO2- R
13. What is the need of bio – amplifier? CO3- Ana
14. What are the various methods of blood flow measurement? CO4- R
15. What is the use of colorimeter? CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Discuss in detail the origin of bio electric potentials with necessary diagrams CO1- U (16)
- Or
- (b) Develop the electrical equivalent circuit of a micro electrode and also discuss its salient features. CO1- U (16)
17. (a) Develop the block diagram of an EEG unit and explain the function of each block. Also bring out the significance of EEG measurement CO2- U (16)
- Or
- (b) Describe the 10 -20 electrode systems used in EEG and give the uses of EEG. CO2- U (16)

18. (a) Explain about the CO3-U (16)
(i) Chopper Amplifier
(ii) Differential Bio - Amplifier
Or
- (b) Explain about the Isolation Amplifier CO3- Ana (16)
19. (a) (i) Classify the different methods of monitoring blood pressure. CO4- U (8)
Explain the concept involved in monitoring BP using sphygmomanometer.
- (ii) Describe the fick's method for the determination of cardiac CO4- U (8)
output.
- Or
- (b) Give the theory behind the thermodilution method and explain the CO4- U (16)
measurement technique for Cardiac Output using that method.
20. (a) Discuss in detail the flame photometer with necessary diagrams CO5- U (16)
Or
- (b) With a neat block diagram explain the spectrophotometer in CO5- U (16)
detail.

