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Question Paper Code: 55503

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

Fifth Semester

Electronics and Instrumentation Engineering

15UEI503 - BIOMEDICAL INSTRUMENTATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The recorded representation of bioelectric potentials generated by the neuron activity of the brain is called the CO1- R
(a) ECG (b) EEG (c) EMG (d) ERG
2. _____ electrode is used for the measurement of more than one ions present in the physiological measurement. CO1-U
(a) Glass (b) Micro
(c) Body surface (d) Specific ion
3. The Lead vector for lead I, II, III in ECG is CO2-U
(a) 0, 60, 120 Deg (b) 30, 60, 0 Deg (c) 0, 30, 60 Deg (d) 30, 60, 90 Deg
4. The amplitude of EEG is approximately around _____ micro V. CO2- R
(a) 10 (b) 20 (c) 30 (d) 40
5. Which one of the following condition will not a cause of respiratory alkalosis? CO3- R
(a) Fever (b) Anxiety
(c) Laryngeal obstruction (d) Salicylate toxicity
6. Homeostatic regulation of the cardiovascular system is designed to maintain _____. CO3- R
(a) Constant blood volume (b) Constant arterial blood pressure
(c) Constant cardiac output (d) Constant venous blood pressure

7. If the defibrillator detects fibrillator, the capacitors with the device charged up to ___ CO4- R
 (a) 100 V (b) 250 V (c) 375 V (d) 750 V
8. In chassis leakage current measurement, the capacitor is employed to imitate the sensitivity of the heart as a function of _____ CO4 -R
 (a) Current (b) Voltage (c) Frequency (d) Power
9. Which of the following is not a factor determining spatial resolution? CO5 -R
 (a) Frequency (b) Transmit intensity (c) Pulse interval (d) Acquisition
10. Which imaging technique uses sound waves to bounce off tissues and reflect back to a transducer? CO5- R
 (a) Computed Tomography (CT) (b) Biophotonics
 (c) Positron Emission Tomography (PET) (d) Ultrasound

PART – B (5 x 2= 10Marks)

11. Differentiate between polarisable and non-polarisable electrodes CO1 -Ana
12. List the different types of needle electrode. CO2- R
13. Define cardiac output. CO3- R
14. State the need for cardiac pacemaker. CO4- R
15. Analyze the biological effects of NMR imaging. CO5-Ana

PART – C (5 x 16= 80Marks)

16. (a) Explain the electrical equivalent circuit diagram for skin interface electrode for a pair of electrodes in bio potential recording. CO1- U (16)
 Or
 (b) What is the diameter of the tip of micro electrode? Why it should be so small explain? CO1-U (16)
17. (a) Explain the electrode configuration, recording methods and waveforms of ECG. CO2- U (16)
 Or
 (b) Explain the electrode configuration, recording methods and waveforms of EMG. CO2- U (16)
18. (a) Explain working principle of Pulsed doppler flow meter. Why it is preferable over other types of flow meters. CO3-U (16)
 Or
 (b) Illustrate the any two methods of respiratory rate measurement. CO3-U (16)

19. (a) Explain the working of Heart – Lung machine. CO4- U (16)
Or
(b) Explain the important safety consideration in all bio-equipped devices in hospitals. CO4-U (16)
20. (a) Illustrate the multi channel telemetry of ECG and respiration. CO5- U (16)
Or
(b) Explain the working principle of X – Ray machine. CO5- U (16)

