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**Question Paper Code: 59422**

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

Elective

Electronics and Communication Engineering

15UEC922- MEDICAL ELECTRONICS

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. The bio signal frequencies from various sections of the human body are in the \_\_\_\_\_ CO1- R  
(a) RF frequency range (b) Microwave range  
(c) 0 to few KHz (d) Few KHz to MHz
2. Among the following electrodes, which have high Zi? CO1- R  
(a) Surface electrodes (b) Needle electrodes (c) Micro electrodes (d) Disc electrodes
3. Relaxation and contraction of heart muscle is called CO2- R  
(a) Systole, Diastole (b) Diastole, Systole  
(c) Hematocrit determination (d) LBC
4. Blood flow can be measured using the electromagnetic principle because blood has a high CO2- R  
(a) Magnetic induction (b) Electrical resistivity  
(c) Electrical conductivity (d) Impedance
5. The polymeric material used for the preparation of artificial heart valve is CO3- R  
(a) polyvinyl chloride (b) Teflon (c) Polyisopropyl (d) polyethylene
6. To produce ventricular contraction with an electric pulse, the minimum energy required is CO3- R  
(a) 10 $\mu$ J (b) 1J (c) 10mW (d) 1 W

7. Among the following imaging system, which has more noninvasive character? CO4- R
- (a) Ultrasonic imaging system (b) CT imaging system
- (c) Nuclear imaging system (d) PET systems
8. The time taken by ultrasonic wave to travel through a soft tissue of thickness 7cm and back when they are moving through it with a velocity 1540 m/s is CO4- R
- (a) 45.45 $\mu$ s (b) 215.6  $\mu$ s (c) 90.91  $\mu$ s (d) 4.55  $\mu$ s
9. All apparatus in contact with a patient during cardiac catheterization must be designed to prevent ----- CO5- R
- (a) leakage current (b) grounding (c) macro shock (d) virus infection
10. The type of endoscope device used to study the stomach is \_\_\_\_\_ CO5- R
- (a) Cytoscope (b) Gastroscope (c) Bronchoscope (d) Otoscope

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. With diagram, explain the different lead configurations and its significances in ECG. CO1- U (8)
12. Describe a procedure for the measurement of pH and pO<sub>2</sub> in blood with a neat diagram CO2-U (8)
13. Explain in detail about the components of a bio-telemetry system Working. CO3-U (8)
14. Explain the process of image reconstruction using MRI CO4- U (8)
15. Discuss in detail about applications of LASER in medicine. CO5- U (8)