A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 55B02

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

Fifth Semester

Biomedical Engineering

15UBM502- DIAGNOSTIC AND THERAPEUTIC EQUIPMENTS-II

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Ultrasonic waves are easily focused because of their beams are obtained with _____ spreading. CO1- R

   (a) Little (b) Very Little (c) High (d) Very High

2. What is AED in ultrasonic transducer? CO1- R

   (a) Active Element Diameter (b) Active Electronic Device

   (c) Active Element Device (d) Active Electronic Diameter

3. The objective assessment of respiratory function is performed clinically with _____ as the first time scale. CO2- R

   (a) Pulmonary gas Volume (b) Pulmonology Care Unit

   (c) Pulmonary Function Test (d) Lung Volume Test

4. A pneumo tachometer has 100 capillary tubes., each with a diameter of 1mm and length of 5cm. What pressure drop occurs for a flow of 1 liter/sec. CO2- R

   (a) 10.74cmH2O (b) 15.74cmH2O (c) 4.74cmH2O (d) 3.74cmH2O

5. What is the maximal sound level loss in the clinical observation for air conduction impairment with middle ear? CO3- R

   (a) 60dB (b) 120 dB (c) 10 dB (d) 200 dB

6. Choose the exact GSR value. CO3- R

(a) 1Ω to 500Ω (b) 1MΩ to 500MΩ (c) 1k to 500kΩ (d) None of the Above

7. The term fulguration refers to a _____ CO4- R

(a) Superficial tissue coagulation without affecting deep-seated tissues

(b) Deep-seated tissue destruction without affecting superficial tissues

(c) Deep-seated tissue coagulation without affecting superficial tissues

(d) Superficial tissue destruction without affecting deep-seated tissues

8. _____ undamped high frequency current from RF generator is suitable for making clean cuttings. CO4- R

(a) 1.75MHz (b) 100MHz (c) 10kHz (d) 1.75kHz

9. For a new construction the voltage between a reference ground point and exposed conductive surfaces should not exceed _____. CO5- R

(a) 500mV (b) 20mV (c) 100mV (d) 40mV

10. _____ is the current which flows through the patient from or to the applied part of the patient circuits. CO5- R

(a) Patient leakage current (b) Earth leakage current

(c) Enclosure leakage current (d) All of the Above

PART – B (5 x 2= 10 Marks)

11. State the fundamental principle of echo technique. CO1- R

12. Compare spirometry with whole body plethysmography. CO2- R

13. List any four sensory system in human body. CO3- R

14. What is desiccation? CO4- R

15. List any four precautions to minimize electric hazards. CO5- R

PART – C (5 x 16= 80 Marks)

16.	(a)	(i) Write short notes on various imaging modes in today's ultrasound system.	CO1- Ana	(6)
		(ii) Discuss in detail about the A-scan mode and M-scan mode with suitable diagrams.	CO1- Ana	(10)
		Or		
	(b)	(i) Explain the device which is used minute and harmless quantities of pulsed ultrasound to measure physical characteristics of the intracranial contents.	CO1- Ana	(8)
		(ii) Identify the significance of ultrasonic techniques in obstetrics and gynecology. Explain the technique with appropriate illustrations.	CO1- Ana	(8)
17.	(a)	Elucidate the Total Body Plethysmography with suitable sketches. Also, list the significance of TBP in Thoracic and Alveolar pressure measurements.	CO2- U	(16)
		Or		
	(b)	Discuss in detail about the following with necessary diagrams.	CO2- U	(8)
		(i) Nebulizers		
		(ii) Inhalators	CO2- U	(8)
18.	(a)	List the differences between the following instruments. Also investigate the working principle and functioning of those instruments. (i) EOG (ii) ERG	CO3- U	(16)
		Or		
	(b)	Examine the basic principle, construction and operations of EGG. Discuss its clinical applications with right examples.	CO3- U	(16)

19. (a) Draw the block diagram of a surgical diathermy machine. Why do we use isolated circuit in the output circuit? CO4- Ana (16)

Or

(b) What are the hazards associated with the use of electro surgery units? How can high frequency circuit hazards be minimized? Explain with the help of a diagram. CO4- Ana (16)

20. (a) Device your own hospital-patient micro shock situation. Give complete details, including a diagram and equivalent circuit. Describe all tests and give the standards for test results necessary to ensure the safety of the patient. CO5- U (16)

Or

(b) What is the function of a safety analyzer? Explain with the help of a block diagram the method for measurement of chasis leakage current. CO5- U (16)