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

Question Paper Code: 55B02

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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. In human body the interference which acts as a perfect mirror for ultrasonics is CO1- R

   (a) Soft tissue/gas interface (b) Tissue/lung interface

   (c) Soft tissue/bone interface (d) Electrolyte/gas interface

2. The Echoencephalogram can involve recording of electrical potential form CO1- R

   (a) Groups of neurons via electrodes placed on the scalp (b) Single neurons

   (c) Groups of neurons via electrodes inserted into the brain (d) All of the above

3. Lung volume and capacity are measured using CO2- R

   (a) Photometer (b) Spirometer (c) Pneumotachometer (d) Potentiometer

4. Ventilators are primarily used in CO2- R

   (a) Intensive care medicine (b) Home care

   (c) Emergency medicine (d) All of the above

5. Electro Retinograph measures CO3- R

   (a) Electrical activity of the heart (b) Electrical activity of the brain

   (c) Electrical activity of the muscle (d) Electrical activity of the eye

6. The galvanic skin response is used to know CO3- R

(a) Cardiac activity of heart (b) Functional activity of heart

(c) Thermal activity of sweat gland (d) None of these

7. The indications for continuous short wave diathermy is CO4- R

(a) Relief pain and muscle spasm (b) Increase blood flow

(c) Increase rate of cell metabolism (d) Increase joint stiffness

8. What is the frequency range of sound used for ultrasonic diathermy CO4- R

(a) 0.1 MHz --0.7 MHz (b) 0.7 MHz --3.3 MHz

(c) 3.3 MHz --5 MHz (d) 5 MHz --15MHz

9. Micro shocks may occur CO5- R

(a) Due to flow of 1A current flow across the body surface

(b) Due to 5A current flow across the body for one minute

(c) Due to shortening of electrical leads in the pacemaker

(d) Due to flow of few mA current across the cardiac muscles

10. 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

PART – B (5 x 2= 10 Marks)

11. Define the Ultrasound. Give its range in medical application. CO1- R

12. What is Apnea monitor? CO2- R

13. GSR measurements assist in what diagnosis? CO3- R

14. Write short note on ultrasonic diathermy. CO4-U

15. Draw the circuit diagram of isolated power system. CO5- R

PART – C (5 x 16= 80 Marks)

16.	(a)	With suitable diagram explain complete set up with working principles of A-mode, B-mode and M- mode ultrasound scanning techniques.	CO1- U	(16)
		Or		
	(b)	Evaluate the application of ultrasound as diagnostic tool in ophthalmology.	CO1- App	(16)
17.	(a)	Illustrate the function of human lung and explain lung volume and breathing measurements.	CO2- U	(16)
		Or		
	(b)	Classify and explain the various modes of functionalities in ventilators.	CO2- Ana	(16)
18.	(a)	Explain the function and applications of Electroretinograph.	CO3 Ana	(16)
		Or		
	(b)	Narrate the instrumentation and working of Electrogastrograph.	CO3 Ana	(16)
19.	(a)	Classify and explain the various types diathermic methods.	CO4 U	(16)
		Or		
	(b)	Elaborate the operations of Electro surgery machine and explain tissue responses.	CO4-U	(16)
20.	(a)	What are the basic approaches followed to protect against shock and write about the protection equipment design.	CO5 U	(16)
		Or		
	(b)	Draw and explain how electrical safety analyzer ensures patient safety and write how to test the electrical system.	CO5 U	(16)