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

Question Paper Code: 54B06

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

Fourth Semester

Biomedical Engineering

15UBM406-DIAGNOSTIC AND THERAPEUTIC EQUIPMENTS-I

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following statements concerning the cardiac output is correct? CO1- R

   (a)Is increased by aldosterone released from the adrenal medulla

   (b) Increased by stimulation of the vagus nerve

   (c) Can be measured by dividing the oxygen consumption by the difference in PO_2 of the venous and arterial blood.

   (d) Is largely determined by the end-diastolic volume

2. Sino-Atria (SA) Node produces SA rhythm in which range? CO1- R

   (a) 40-50 Pulses/min (b) 20-30 Pulses/min

   (c) 60-80 Pulses/min (d) 90-100 Pulses/min

3. The normal awake state of EEG signal has the frequency components in the range? CO2- R

   (a) Delta [1-4 Hz] (b) Theta [4-8Hz] (c) Beta [15-30Hz] (d) Alpha [8-15Hz]

4. In normal occipitals Alpha waves---------- CO2- R

   (a) 8-13 (b) 13-30 (c) 4-8 (d) 2-4

5. A typical EMG signal ranges are? CO3-R

   (a) 0-250Hz (b) 100-1000Hz (c) 0-10KHz (d) DC-500Hz

6. Galvanic current passed through the body is CO3- R

(a) 0.3-0.5mA/cm^2 (b) 0.5-0.6mA/cm^2

(c) 0.6-0.8 mA/cm^2 (d) 0.8-1 mA/cm^2

7. Central Patient monitoring System employed in CCU is also called as? CO4- R

(a) Bedside monitor (b) Non-invasive BP Monitor

(c) Nurse desk monitor (d) Out Patient monitor

8. The driving pressure is the difference between the _____generated by the column of liquid in the administration set and the venous pressure in drug delivery system. CO4- R

(a) Hydrostatic pressure (b) Blood pressure

(c) Valve pressure (d) Both a and C

9. Air bubble detection circuitry is needed in which machine? CO5-R

(a) Hemo-dialyser (b) Endoscopes (c) Lithotripsy (d) Laparoscopy

10. The cryogenic refrigerators are reduce or eliminate the need for refilling the liquid _____reservoir. CO5-R

(a) Helium (b) Xeon (c) Hydrogen (d) Nitrogen

PART – B (5 x 2= 10Marks)

11. What is the need of defibrillator? CO1- U

12. Write short notes on EEG? CO2- R

13. Explain interrupted galvanic current? CO3- R

14. Sketch the schematic diagram of Biotelemetry system with labels. CO4- U

15. Sketch acoustic shock-wave pulse. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) (i) Describe in detail about unipolar and bipolar limb lead system used for measuring ECG CO1- U (8)

(ii) Illustrate various pacing modalities in demand pacemakers with its significance and its instrumentation involved. CO1- U (8)

Or

(b) (i) Describe block diagram approach of a Phonocardiograph machine. CO1- U (8)

(ii) Explain the working of any one type of Defibrillator circuit CO1- U (8)

17.	(a)	Explain with neat block diagram of modern EEG unit?	CO2- U	(16)
		Or		
	(b)	Explain with neat blog diagram of MEG unit?	CO2- U	(16)
18.	(a)	Explain different types of waveforms used in stimulators?	CO3- U	(16)
		Or		
	(b)	(i) Describe the circuit which is used to determine muscle fatigues.	CO3- U	(8)
		(ii) How is EMG biofeedback circuit developed to cure pain?	CO3- U	(8)
19.	(a)	(i) Explain with sketch the working principle of 3-channel Patient monitoring system.	CO4- U	(8)
		(ii) Bring out difference in operation of syringe pump and infusion pump.	CO4- U	(8)
		Or		
	(b)	Explain the working principle multi-channel telemetry system with a neat block diagram.	CO4- U	(16)
20.	(a)	With suitable diagram, explain in detail about Heart-Lung machine.	CO5- U	(16)
		Or		
	(b)	Illustrate the technicality of 'Laparoscopy' as pin –hole surgery tool for abdomen applications.	CO5- U	(16)