

B.E. / B.TECH. DEGREE EXAMINATIONS, September 2020

Eighth Semester

EE16020 – BIOMEDICAL INSTRUMENTATION*(Electrical and Electronics Engineering)***(Regulation 2016)****Time: Three Hours****Maximum : 80 Marks**

Answer ALL questions

PART A - (8 × 2 = 16 Marks)

	CO	RBT
1. The junction between one neuron and the next, or between a neuron and an effector is: a. Dendrite b. Synapse c. Neurotransmitter d. Axon	1	U
2. A Spirometer is used for measuring a. Distribution b. Ventilation c. Diffusion d. Absolute lung volumes	2	AN
3. The depolarization stimulus for the normal heart beat originates in the: a. Epicardium b. His-Bundle c. Sinoatrial (SA) node d. Atrioventricular (AV) node	3	U
4. The behaviour of hydrogen protons is the basis for producing an image of the cross section of the body in: a. PET scan b. CT scan c. MRI scan d. Ultrasonography	4	AN
5. Explain the process of pulmonary circulation in cardiovascular system.	1	AN
6. How is the acid-base balance of blood determined?	2	E
7. What is the use of depth and needle electrodes?	3	AN
8. What are the uses of ultrasound in medical field?	4	AP

PART B - (4 × 16 = 64 Marks)

9. (a) What is active transport in a cell membrane? Explain the different stages with relevant waveforms.	(16)	1	AN
(OR)			
(b) (i) Discuss about the generation of ultrasonic waves using piezoelectric transducers and its equivalent circuit at resonance.	(08)	1	AN
(ii) Explain about the applications of Piezoelectric Transducers in detail.	(08)	1	AP
10. (a) Discuss how blood pressure can be measured using heart sounds.	(16)	2	AN

(OR)

- (b) Explain the applications of blood gas analysers in detail. (16) 2 AP
11. (a) Discuss about the 12 lead system used in ECG and the various abnormal conditions in the recorded waveform. (16) 3 AN
- (OR)**
- (b) What are chopper amplifiers? Draw a non-mechanical chopper amplifier and explain its operation. Mention their importance in biomedical systems. (16) 3 AP
12. (a) (i) Distinguish between time division multiplexing and frequency division multiplexing systems used in the transmission of biosignals. (12) 4 AN
- (ii) What are the uses of biotelemetry? (4) 4 AP
- (OR)**
- (b) (i) Draw the block diagram of a CT scanner and explain image reconstruction using the matrix values. (12) 4 E
- (ii) What is an Endoscope? List the types of endoscopes used in various diagnostic conditions. (4) 4 C