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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S,FE) Examinations September 2026 (2019 Scheme)

Course Code: ECT414
Course Name: BIOMEDICAL ENGINEERING

Max. Marks: 100 **Duration: 3 Hours**

PART A
Answer all questions, each carries 3 marks.

		Marks
1	Explain the concept of any three bioelectric signals and their applications.	(3)
2	Write the Nernst equation and state its significance.	(3)
3	Explain the role of lungs in oxygenating the blood.	(3)
4	What is the principle of operation of ultrasonic blood flow meters?	(3)
5	List any three brain waves and the information that can be gathered from them.	(3)
6	Explain the significance of any three respiratory parameters.	(3)
7	What is fibrillation? How can it be corrected?	(3)
8	What is the principle of working of a flame photometer.	(3)
9	Explain the principle of ultrasound imaging.	(3)
10	List any three advantages of CT imaging over X-ray imaging.	(3)

PART B
Answer any one full question from each module, each carries 14 marks.

Module I

11	a)	Explain the formation of resting and action potentials in cells. Illustrate with necessary diagrams.	(8)
	b)	Explain the constructional details of any two skin surface electrodes.	(6)

OR

12	a)	Explain any one biopotential amplifier used in biomedical applications.	(7)
	b)	Draw and explain the basic block diagram of a biomedical instrumentation system.	(7)

Module II

13	a)	Explain the biopotential conduction system of the heart and correlate it with a typical ECG waveform.	(8)
	b)	Explain the ausculatory method of blood pressure measurement.	(6)

OR

14	a)	Explain the working of electromagnetic blood flow meters	(8)

b) Explain the block diagram of an ECG machine with necessary illustration (6)

Module III

15 a) Illustrate and explain the working principle of body plethysmograph (6)

b) Explain with illustration the10-20 electrode placement in EEG measurement (8)

OR

16 a) Explain the human nervous system in detail. (7)

b) Explain with illustration, the functioning of human respiratory system. (7)

Module IV

17 a) With the help of block diagram explain the working of heart–lung machine (8)

b) Explain dialysis method. (6)

OR

18 a) What are pacemakers? With the help of block diagram, explain the working of a pacemaker. (8)

b) Explain with illustration the working principle of single channel telemetry system. (6)

Module V

19 a) Explain the principle of ultrasonic imaging (4)

b) What is Nuclear Magnetic Resonance imaging? Explain the working principle with illustration. (10)

OR

20 a) Explain the principle and image reconstruction in computed Tomography. (10)

b) List any four applications of X-rays in medical field. (4)

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