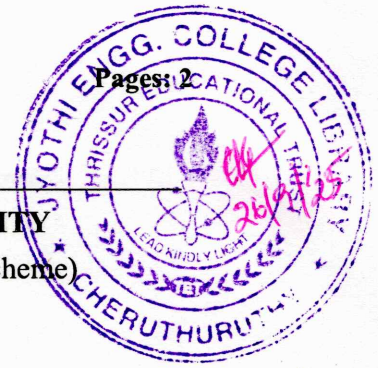


B

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Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
B.Tech Degree S8 (S) Examination September 2025 (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  | The resting potential of a cell is about -70 mV. Illustrate the mechanism by which the cell potential is increased to +20 mV when excited. | (3) |
| 2  | State the Nernst relation.   | (3) |
| 3  | What is systole and diastole? Also mention the normal values.  | (3) |
| 4  | What is Korotkoff sounds?  | (3) |
| 5  | List out any three brain waves and state when they occur.  | (3) |
| 6  | Explain any three respiratory parameters.  | (3) |
| 7  | What is a dialyser? List any two types.  | (3) |
| 8  | Explain the working of a pH meter.   | (3) |
| 9  | What are the advantages of CT imaging over X-ray imaging?  | (3) |
| 10 | Explain the principle of ultrasound imaging.   | (3) |

**PART B**

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

**Module I**

- |        |   |     |
|--------|---|-----|
| 11. a) | Explain the working of an isolation amplifier with necessary illustrations. | (7) |
| b)     | Explain man instrument system with necessary illustrations.                 | (7) |

**OR**

- |        |  |     |
|--------|--|-----|
| 12. a) | Explain any one bio potential amplifier used in clinical instruments with diagram. | (8) |
| b)     | Explain the basic structure of needle electrodes. List any two applications.       | (6) |

**Module II**

- |        |   |     |
|--------|---|-----|
| 13. a) | Explain the method of ultrasonic non-invasive blood pressure measurement. | (7) |
| b)     | Explain unipolar limb lead configuration with necessary illustrations.    | (7) |

**OR**

- |        |  |     |
|--------|--|-----|
| 14. a) | Explain electroconduction system of the heart with necessary illustration. | (8) |
| b)     | Illustrate the working of electromagnetic blood flow meter.                | (6) |

**Module III**

- 15 a) Draw and explain the block diagram of an EEG machine. (7)  
b) Explain with illustration, the electrical stimulation of the muscle and nerve. (7)

OR

- 16 a) Explain 10-20 electrode scheme with necessary illustrations. (7)  
b) Illustrate the instrumental setup for EMG measurement. (7)

**Module IV**

- 17 a) Explain the working of any defibrillator circuit. (7)  
b) With block diagram, explain biomedical telemetry system. (7)

OR

- 18 a) Explain with illustration, the working principle of flame photometer. (7)  
b) Illustrate the working principle of a blood cell counter. (7)

**Module V**

- 19 a) Explain the block diagram of an X-ray imaging system. (9)  
b) Explain the hazards caused to a human body on getting an electrical shock. (5)

OR

- 20 a) Explain the basic components associated with NMR imaging. (7)  
b) Explain the working principle of computed tomography (7)

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