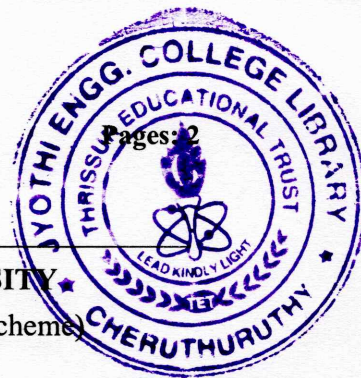


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S8 (S) Examination September 2025 (2019 Scheme)

Course Code: MRT428

Course Name: BIO MECHATRONICS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|---|-----|
| 1 | Differentiate between polarisable and non-polarisable electrodes. | (3) |
| 2 | Write short note on electrode electrolyte interface. | (3) |
| 3 | Explain the relevance of SA node in the function of Heart. | (3) |
| 4 | Sketch a typical PQRS complex waveform with respect to ECG. | (3) |
| 5 | List the different stages of sleep. | (3) |
| 6 | Explain about Evoked potentials. | (3) |
| 7 | What is the importance of artificial ventilation? | (3) |
| 8 | Differentiate between heart sounds and heart murmurs. | (3) |
| 9 | Write a short note on electrical shock hazards. | (3) |
| 10 | What is a defibrillator and how it ensures patient safety? | (3) |

PART B

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

Module I

- | | | |
|----|---|-----|
| 11 | a) With neat sketch explain in detail about the resting potential and action potential. | (7) |
| | b) Describe the types of surface electrodes. | (7) |

OR

- | | | |
|----|---|-----|
| 12 | a) With neat sketch differentiate between animal cell and plant cell. | (7) |
| | b) Explain refractory periods? | (7) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Explain ECG leads with necessary figures. | (7) |
| | b) Sketch and brief the function of Heart. | (7) |

OR

- | | | |
|----|---|-----|
| 14 | a) Write short note on Arrhythmias. | (7) |
| | b) What is a pace maker? Explain its types and functions. | (7) |

Module III

- 15 a) Draw a figure showing how the electrodes are placed in a 10 – 20 system of placement of electrodes to perform the EEG analysis. (7)
- b) Explain a brain wave. What are its characteristics? (7)

OR

- 16 Explain the block diagram of EEG machine. Also explain different stages of evoked potential. (14)

Module IV

- 17 a) With the help of neat diagram explain phonocardiography. (7)
- b) What is the importance of artificial ventilation? (7)

OR

- 18 Explain one method of blood flow measurement. Also explain vector cardiography with the help of neat diagram. (14)

Module V

- 19 a) Explain the concept of centralized patient monitoring system. (7)
- b) What is a CT scanner and how does it work? (7)

OR

- 20 Explain the heart lung machine with the help of neat diagram. (14)
