

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S) Examinations April 2026 (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 | Define electrodes and mention the various types of electrode. | (3) |
| 2 | What is refractory period? Mention the types. | (3) |
| 3 | What is SA node and what are the phases associated with SA node action potential? | (3) |
| 4 | What is lead configuration? List out the types of unipolar leads. | (3) |
| 5 | Explain the different types of brain waves. | (3) |
| 6 | Explain the different stages of evoked potential. | (3) |
| 7 | Write a short note on vector cardiography. | (3) |
| 8 | Explain the principle behind the electromagnetic flow meter. | (3) |
| 9 | Explain the necessity of cardiac pacemakers. | (3) |
| 10 | Describe the role of heart lung machine and enumerate its components. | (3) |

PART B

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

Module I

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|----|--|-----|
| 11 | a) With suitable diagram explain about the cell structure. | (7) |
| | b) Explain in detail about different types of surface electrode. | (7) |

OR

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|----|---|-----|
| 12 | a) Draw an action potential waveform and discuss in detail about polarization and repolarization. | (8) |
| | b) Draw and explain electrode electrolyte interface with equivalent circuit. | (6) |

Module II

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|----|---|-----|
| 13 | a) Illustrate about the events related with ECG waveform. | (7) |
| | b) Write a short note on Einthoven triangle. | (7) |

OR

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|----|--|------|
| 14 | a) Explain in detail about ECG lead configuration. | (14) |
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Module III

- 15 a) With neat sketch, explain electrode placement system of EEG. (14)

OR

- 16 a) With the help of necessary block diagram explain about EEG machine. (14)

Module IV

- 17 a) Explain any one indirect method used for the measurement of blood pressure. (8)

- b) Explain the concept of plethysmography. (6)

OR

- 18 a) Explain about the cardiac output measurement by dilution method. (7)

- b) Explain in detail about phonocardiography. (7)

Module V

- 19 a) Compile a short note on electrical shock hazards. (6)

- b) Explain the working of MRI scanner. (8)

OR

- 20 a) Describe the concept of centralized patient monitoring system (6)

- b) Explain the basic ideas of CT scanner. (8)
