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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Regular Examination June 2023 (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 bioelectric potential. With relevant diagrams explain electrical activity of excitable cells in detail | (3) |
| 2 | Illustrate and explain action potential and resting potential | (3) |
| 3 | Illustrate brain waves and explain | (3) |
| 4 | Explain the different stages of sleep | (3) |
| 5 | Explain the factors affecting the measurement of blood pressure | (3) |
| 6 | Explain the different stages of evoked potential | (3) |
| 7 | Write a short note on phonocardiography | (3) |
| 8 | Explain vector cardiography | (3) |
| 9 | Write a short note on DC defibrillator | (3) |
| 10 | Explain the hazards associated with biomedical instruments | (3) |

PART B

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

Module I

- | | | |
|----|--|-----|
| 11 | a) Briefly any two classification of surface electrode with figure | (8) |
| | b) Write a short note on electrode electrolyte interface | (6) |

OR

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|----|--|------|
| 12 | a) Evaluate on S-D curve | (4) |
| | b) Compare unipolar and bipolar electrodes. Also explain bioelectric signals and their characteristics | (10) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Elucidate the working of ECG in detail with neat sketch | (7) |
| | b) Illustrate and explain ECG waveforms | (7) |

OR

- 14 a) Explain ECG leads with necessary figures (7)
b) Discuss about events related to different waves in ECG (7)

Module III

- 15 a) Describe in detail about the electrical activity of brain (4)
b) Write notes on measurement of EEG with necessary block diagram (10)

OR

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

Module IV

- 17 a) Compose a short note on BP. With relevant figure explain electromagnetic blood flow meter (7)
b) Explain phonocardiography (7)

OR

- 18 a) Sketch and explain in detail about the direct and indirect blood pressure measurement (14)

Module V

- 19 a) With the help of a block diagram explain artificial ventilator in detail (14)

OR

- 20 a) Compose a note on patient safety when biomedical instruments are operated (7)
b) Compile a short note on electrical shock hazards (7)
