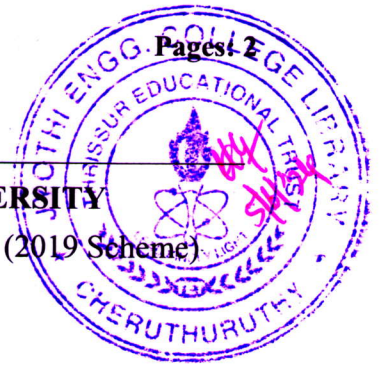


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree (R,S) Examination May 2024 (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 | Write short note on electrode electrolyte interface. | (3) |
| 2 | Define Half -cell potential? What are polarisable and non-polarisable electrodes? | (3) |
| 3 | Sketch a typical PQRS complex waveform with respect to ECG and explain. | (3) |
| 4 | Draw Einthoven triangle and explain how it is used in ECG measurement. | (3) |
| 5 | Explain the different stages of evoked potential. | (3) |
| 6 | Describe in detail about the electrical activity of brain. | (3) |
| 7 | What is the need of blood flow measurement? | (3) |
| 8 | Write a short note on phonocardiography. | (3) |
| 9 | Describe the concept of centralized patient monitoring system. | (3) |
| 10 | Write short note on patient safety when biomedical instruments are operated. | (3) |

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

- | | | |
|----|--|------|
| 11 | Give a detailed narration of different bio electrodes used for biomedical instrumentation. | (14) |
|----|--|------|

OR

- | | | |
|-------|--|-----|
| 12 a) | With neat sketch explain in detail about the resting potential and action potential. | (8) |
|-------|--|-----|

- b) With relevant diagrams explain electrical activity of excitable cells in detail. (6)

Module II

- 13 a) Describe the standard 12 lead system and recording method of ECG. (14)

OR

- 14 Draw an ECG of a normal person, labelling the critical features and explain the working of an ECG machine. (14)

Module III

- 15 a) What are brain waves? Write notes on measurement of EEG with necessary block diagram. (14)

OR

- 16 a) With neat sketch. Explain electrode placement system of EEG. (9)
b) Explicate the different stages of sleep. (5)

Module IV

- 17 a) With relevant figure explain electromagnetic blood flow meter. (10)
b) Differentiate between heart sounds and heart murmurs. (4)

OR

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

Module V

- 19 a) Explain heart lung machine with the help of neat diagram. (10)
b) Explain the working of MRI scanner. (4)

OR

- 20 a) With the help of a block diagram explain artificial ventilator in detail. (10)
b) Write a short note on electrical shock hazards. (4)
