

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree Regular and Supplementary Examination June 2023 (2019 Scheme)

**Course Code: EET312****Course Name: BIOMEDICAL INSTRUMENTATION**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 3 marks.*

Marks

- | | | |
|----|---|-----|
| 1 | Draw and explain the equivalent circuit of skin electrode interface. | (3) |
| 2 | Explain resting and action potential. | (3) |
| 3 | Draw ECG waveform & explain. | (3) |
| 4 | With neat sketches explain the different electrode placements in ECG. | (3) |
| 5 | Explain how nerve conduction velocity is measured? | (3) |
| 6 | Draw different EEG waveforms and state its frequency. | (3) |
| 7 | Explain the principle of MRI scanning. | (3) |
| 8 | Distinguish between internal and external pacemaker. | (3) |
| 9 | Enumerate the applications of robotics in medical field. | (3) |
| 10 | Differentiate between macro shock and micro shock. | (3) |

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

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|----|--|-----|
| 11 | a) Explain the generation and propagation of bioelectric potentials? | (7) |
| | b) Explain the anatomy of human nervous system. | (7) |

OR

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|----|---|-----|
| 12 | a) Draw and explain the equivalent circuit of a bio potential electrode in contact with an electrolyte? | (6) |
| | b) Explain anatomy of heart and cardiac system. | (8) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Explain Electro-conduction system of the heart? | (7) |
| | b) Explain working of ECG machine with a neat block diagram. | (7) |

OR

- 14 a) Explain the method of blood pressure measurement using oscillometric method. (7)
b) Explain the method of blood flow measurement using electromagnetic blood flow meter? (7)

Module III

- 15 a) Explain 10-20 electrode placement system? (7)
b) Explain EMG measurements with a block diagram? (7)

OR

- 16 a) With block diagram explain the working of EEG machine. (8)
b) Explain the working of spirometer? (6)

Module IV

- 17 a) With neat diagram explain different NMR components in an MRI system. (8)
b) Explain artificial kidney with neat sketches. (6)

OR

- 18 a) Explain the generation of x rays and also mention its application in biomedical engineering. (8)
b) With neat diagram explain the principle of Ultrasound imaging? Differentiate between B-mode and M-mode imaging? (6)

Module V

- 19 a) What are the different methods of accident prevention in hospitals? (8)
b) With neat block diagram explain the working of telemedicine. (6)

OR

- 20 a) Explain the working of heart lung machine with neat block diagram. (7)
b) What are the chemical blood tests carried out in a clinical laboratory? (7)
