

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (S,FE) Examination December 2025 (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 | What are the applications of needle electrodes? | (3) |
| 2 | Explain the problems encountered in biomedical measurements. | (3) |
| 3 | Explain the measurement of Cardiac output? | (3) |
| 4 | What is Phonocardiography? | (3) |
| 5 | Explain the 10-20 system of EEG electrodes placement | (3) |
| 6 | What are the applications of EEG waveforms? | (3) |
| 7 | What is ultrasonic image principle? | (3) |
| 8 | Explain Neuron Communication | (3) |
| 9 | Explain the mechanism of infant incubator | (3) |
| 10 | Enumerate the applications of robotics in medical field. | (3) |

PART B

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

Module I

- | | | |
|----|--|-----|
| 11 | a) With neat sketches explain the generation and propagation of action potential | (7) |
| | b) Explain the anatomy of respiratory system with figure. | (7) |

OR

- | | | |
|----|--|------|
| 12 | a) Write notes on surface electrodes | (4) |
| | b) Explain the anatomy of cardiac system with figure | (10) |

Module II

- | | | |
|----|---|-----|
| 13 | a) Explain with diagram the Ultrasonic method of blood pressure measurement | (7) |
| | b) Describe the method of blood flow measurement using electromagnetic blood flow meter | (7) |

OR

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

Module III

- 15 a) Draw and explain the block diagram of EEG machine (7)
b) Draw the different EEG waveforms and state its frequency (7)

OR

- 16 a) Explain the terms tidal volume and vital capacity in breathing mechanism. (7)
b) What is the purpose of measurement of nerve conduction velocity? How is it measured? (7)

Module IV

- 17 a) Explain the generation of X-rays and also mention its applications in biomedical engineering. (10)
b) Which part of haemodialysis machine is called artificial kidney? Explain its structure. (4)

OR

- 18 a) Explain the principle of CAT scanning with diagram (7)
b) Explain the principle of MRI scanning with diagram (7)

Module V

- 19 a) With neat block diagram explain the telemedicine system. (8)
b) Discuss the need for ventilators. (6)

OR

- 20 a) With neat diagram explain the working of heart lung machine. (8)
b) Explain the principle of spectrophotometer analysis. (6)
