

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (R,S) (FT/WP) Examination November 2025 (2019 Scheme).

Course Code: ECT425**Course Name: BIOMEDICAL INSTRUMENTATION****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

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|----|---|-----|
| 1 | Draw the structure of nervous system and label the parts. | (3) |
| 2 | What is electrogastrogram (EGG). | (3) |
| 3 | Write short notes on micro electrodes used in biomedical applications. | (3) |
| 4 | State electrode theory. | (3) |
| 5 | How the blood pressure is measured with the help of percutaneous insertion method. | (3) |
| 6 | Compare electrocardiogram (ECG) and phonocardiogram (PCG) signals. | (3) |
| 7 | Draw and explain the circuit diagram DC defibrillator. | (3) |
| 8 | Define the terms tidal volume and vital capacity in breathing mechanism. | (3) |
| 9 | Explain different methods of electric accident prevention in handling biomedical instruments. | (3) |
| 10 | How image reconstruction is done in CT. | (3) |

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

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|----|--|-----|
| 11 | a) With the help of block diagram explain the biomedical instrumentation system. | (7) |
| | b) How an action potential is generated and propagated through neurons. | (7) |

OR

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|----|---|-----|
| 12 | a) With neat sketch explain the physiological functions of human circulatory system | (8) |
| | b) Differentiate between resting potential and action potential. | (6) |

Module II

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|----|--|-----|
| 13 | a) Draw and explain circuit of instrumentation amplifier in biomedical instrumentation system. | (7) |
| | b) With the help of block diagram explain the functionalities each block present in ECG machine. | (7) |

OR

- 14 a) Explain the electro conduction system of a human heart. Illustrate the same with PQRS waveform of the ECG. (10)
- b) What is Einthoven triangle and mention its significances. (4)

Module III

- 15 a) Draw and explain the auscultatory method of pressure measurement. (7)
- b) Explain the working principle of an electromagnetic blood flow meter. (7)

OR

- 16 a) Explain the principle of impedance plethysmography with necessary sketch. (8)
- b) What is blood pressure? Explain the classifications of direct and indirect blood pressure measurements. (6)

Module IV

- 17 a) Illustrate the working principle of a hemodialyzer. (6)
- b) Write short notes on pneumography and spirometer. (8)

OR

- 18 a) With the help of neat sketch explain the working of heart lung machine. (7)
- b) What is infant incubator? How does it work? (7)

Module V

- 19 a) Draw the diagnostic still picture of X-ray machine and explain its working. (8)
- b) Explain the physiological effects of electric current flowing through human body. (6)

OR

- 20 a) With the help of block diagram explain the working principle of magnetic resonance imaging system. (8)
- b) What is radiation therapy and its side effects to human body. (6)
