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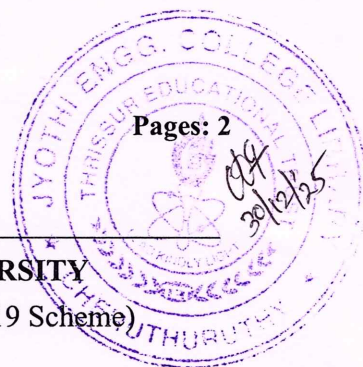
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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S,FE) Examination December 2025 (2019 Scheme)



Course Code: MRT322

Course Name: BIOMEDICAL INSTRUMENTATION

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- | | | |
|----|--|-----|
| 1 | Briefly explain the process of depolarization during an action potential. | (3) |
| 2 | Explain the basic components of a biomedical system. | (3) |
| 3 | List three types of electrodes used in electro-physiological measurements. | (3) |
| 4 | What does ECG stand for? Draw & explain typical ECG waveform. | (3) |
| 5 | Briefly explain an electronic manometer. | (3) |
| 6 | Briefly explain one direct method of blood pressure measurement. | (3) |
| 7 | Explain lithotripsy. | (3) |
| 8 | What are the uses of X-rays in medical diagnosis? | (3) |
| 9 | Give one example of a blood cell test. | (3) |
| 10 | What is the significance of grounding in electrical safety? | (3) |

PART B

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

Module I

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|----|---|-----|
| 11 | a) Explain the role of the cardiovascular system in the body. | (7) |
| | b) Draw a basic diagram illustrating the principle of ultrasonic transducers. | (7) |

OR

- | | | |
|----|---|-----|
| 12 | a) Briefly describe the function of the respiratory system. | (7) |
| | b) What is the significance of selecting the right transducer for a biomedical application? | (7) |

Module II

- | | | |
|----|--|-----|
| 13 | a) Compare and contrast limb electrodes and surface electrodes. | (7) |
| | b) Draw a simple diagram showing the placement of electrodes for a standard ECG. | (7) |

OR

- 14 a) Describe the advantages and disadvantages of pre-gelled disposable electrodes. (7)
b) Describe the typical waveforms obtained in EMG recordings and the procedure for measurement. (7)

Module III

- 15 a) Describe the procedure for measuring blood pressure using the auscultatory method. (7)
b) Describe the indicator dilution method for measuring cardiac output. (7)

OR

- 16 a) Describe the different methods used for temperature measurement. (7)
b) Explain the relationship between blood pressure, blood flow and cardiac output. (7)
How do these parameters influence each other?

Module IV

- 17 a) Describe the process of haemodialysis and its significance in treating kidney failure. (7)
b) Explain the process of endoscopy and its diagnostic applications. (7)

OR

- 18 a) Describe the features and functions of an infant incubator with neat block diagram. (7)
b) Describe the principle of diathermy and its therapeutic uses. (7)

Module V

- 19 a) Explain the concept of leakage current and its potential dangers in medical equipment. (7)
b) Describe the different types of shock hazards in a medical environment and how to prevent them. (7)

OR

- 20 a) Describe the role of safety standards in ensuring electrical safety in medical equipment. (7)
b) Describe the basic principles and applications of telemedicine. (7)
