

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Sixth Semester B.Tech Degree Examination June 2022 (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 | Explain the physiology of <i>Respiratory system</i> . | (3) |
| 2 | Name <i>any three</i> instrument to record bioelectrical potentials generated in human body. | (3) |
| 3 | What is <i>Phonocardiography</i> ? | (3) |
| 4 | What is <i>Einthoven triangle</i> ? | (3) |
| 5 | Explain how <i>nerve conduction velocity</i> is measured? | (3) |
| 6 | Explain the working of <i>spirometer</i> . | (3) |
| 7 | What is <i>lithotripsy</i> ? | (3) |
| 8 | Distinguish between <i>Internal and External pacemaker</i> . | (3) |
| 9 | Enumerate the application of <i>robotics</i> in medical field. | (3) |
| 10 | What is <i>hematocrit</i> ? | (3) |

PART B

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

Module I

- 11 a) Describe *resting potential, action potential* and propagation of action potential with *action potential waveform*. (10)
- b) List different types of *surface electrodes*. (4)

OR

- 12 a) What are the problems encountered in biomedical measurements? (10)
- b) What is *sodium pump* (4)

Module II

- 13 a) Explain in detail a *non-invasive BP measurement* method that uses oscillations in artery walls. (8)
- b) With neat sketches explain the different *leads* used in ECG measurement. (6)

OR

- 14 a) Explain the working of *Electromagnetic blood flow meter*. (6)
b) Explain *photo-electric plethysmography* with an example. (8)

Module III

- 15 a) What are the different *frequency ranges in EEG* signal? Explain. (7)
b) Write a short note on *EMG* measurement. (7)

OR

- 16 a) Explain the terms *tidal volume and vital capacity* in breathing mechanism with neat diagram (6)
b) What do you mean by *Pneumography*? With neat diagram explain impedance pneumography. (8)

Module IV

- 17 a) What do you mean by *Fibrillation*? How do you correct for it? Distinguish (8)
between internal and external defibrillators.
b) With neat diagram explain different *NMR components* in an MRI system (6)

OR

- 18 a) With neat diagram explain the working of *X-ray* machine. What are the uses of X-rays in medicine? (8)
b) Explain the working of *Haemodialysis* machine. (6)

Module V

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

OR

- 20 a) With neat block diagram explain the working of *telemedicine* (8)
b) Define the following terms a) *Macro shock* b) *Micro shock* & c) *Let-go current* (6)
