

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth semester B.Tech degree examinations, September 2020

Course Code: BM482**Course Name: BIOMEDICAL INSTRUMENTATION**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any two full questions, each carries 15 marks.*

Marks

- 1 a) Summarize a typical cell potential waveform. Explain the electrical activity associated due to a trigger in a polarized state. (5)
- b) Generalize the sources of biomedical signals. (5)
- c) Suggest an electrode to study the electrical activity of individual cells. Hence explain its characteristics and classifications. (5)
- 2 a) "Bioacoustic signals provide an indication of the heart rate and its rhythmicity", based on this concept explain the mechanical events associated? (5)
- b) What are the prerequisites for a transducer used in biomedical applications? (5)
- c) Explain photoplethysmograph. (5)
- 3 a) Differentiate between Active and Passive transducers. Write short notes on any of the transducers employed for pressure measurement. (8)
- b) Discuss the working of a defibrillator. (7)

PART B*Answer any two full questions, each carries 15 marks.*

- 4 a) What are the prerequisites for an ideal oxygenator? (5)
- b) Appraise the need for an infusion pump. How does it differ from a syringe pump? (5)
- c) Summarize Infant Incubators. (5)
- 5 a) Based on respiratory parameters explain respiratory volumes. (5)
- b) Generalize the rhythmic patterns obtained from diagnostic equipment to determine epilepsy. (5)
- c) Define evoked potential. What are its classifications? (5)
- 6 a) What is meant by Lithotripsy? Prepare a short note on any two types of shock-wave sources for lithotripsy. (7)
- b) With relevant schematic appraise the instrumentation setup to diagnose epilepsy. (8)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) With relevant schematics explain the working of an X-ray machine. (7)
- b) List out the limitations of using conventional X-rays to examine the internal structures. How can you overcome it? Explain the concept of operation in detail. (8)
- c) Summarize the basic principle of Angiography. (5)
- 8 a) NMR tomography has high-resolution capability and potential for chemical-specific imaging. Explain the basic NMR components that justify the statement. (10)
- b) Explain the vital parameters for optimizing ultrasound transducers in various applications. How the resolution of an ultrasound system can be defined. (10)
- 9 a) Why slip rings are used X-ray Computed Tomography. (5)
- b) Explain the nature of X-rays. (5)
- c) List out the characteristics of ultrasound waves. Hence explain characteristics impedance. (5)
- d) Summarize the principles of NMR imaging system. (5)
