

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2020

Course Code: EC365**Course Name: BIOMEDICAL ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

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

Marks

- 1 a) What is Nernst equation and its application in electrode theory? How are bio potential electrodes classified? (10)
- b) Describe the principle of electromagnetic flowmeter to measure the blood flow? (5)
- 2 a) What is a chopper amplifier? Explain its working and what are its advantages? (7)
- b) Explain the functional block diagram of a modern ECG machine. (8)
- 3 a) What is role of isolation amplifier in clinical laboratory? Explain the working of any one type of isolation amplifier. (7)
- b) It is desired to measure BP of a patient, without causing him any discomfort. Suggest a suitable method and explain the measurement process. (8)

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

- 4 a) What is a pacemaker? Explain its working with a functional block diagram. What are the different types of artificial pacemakers? (10)
- b) Compare and contrast spirometer and plethysmograph. (5)
- 5 a) What are the functional units in a heart-lung machine? Explain. (6)
- b) What is the principle of pulse oximeter? Explain its working with a block diagram. (9)
- 6 a) What is the purpose of measuring nerve conduction velocity? Explain the instrumentation setup for EMG recording. (10)
- b) Explain the principle of different types of ventilators. (5)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the working of X-ray machine with necessary illustrations. (11)
b) List the different applications of telemetry in medicine. Explain any one application in detail. (9)
- 8 a) What is the principle of MRI? What are its advantages over CT imaging? (9)
b) Explain the principle of operation of ultrasonic imaging system. (5)
c) List and describe the different display types of ultrasonic imaging. (6)
- 9 a) What are the advantages of CT over conventional X-ray imaging? Explain the principle of CT imaging. (10)
b) Explain the components of a biotelemetry system. (10)
