

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B. TECH (HONOURS) DEGREE EXAMINATION, DECEMBER 2017

Course Code: EC365

Course Name: BIOMEDICAL ENGINEERING (AE, EC)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) What are microelectrodes? Explain the two basic types of microelectrodes used. (7)
- b) Explain the following ECG lead configurations: (8)
 - i) Unipolar limb leads
 - ii) Precordial leads
- 2 a) What is the principle of operation of a carrier amplifier? State its importance in biomedical instrumentation systems. (4)
- b) Define/State the following: (3)
 - i) Relative refractory period of a cell.
 - ii) All or None principle
- c) With neat labelled diagram, explain the electrical conduction system of the heart. (8)
- 3 a) What is EMG? Explain the type of electrode commonly used for EMG measurement. (4)
- b) Draw and explain the basic block diagram of an isolation amplifier. (4)
- c) Explain any two direct blood pressure measurement techniques. (7)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) What is evoked potential? With the help of neat block diagram, explain a visual and auditory evoked potential system. (7)
- b) What is cardiac defibrillation? (4)
- c) What is haemostasis mode in surgical diathermy machines? Draw the different types of waveforms generated by surgical diathermy machines. (4)
- 5 a) Explain the basic working principle of flame photometry. How is internal standardization achieved in a flame photometer? (5)
- b) What is the principle of transmission oximetry? (2)
- c) Describe any four parameters based on which performance of dialyzers can be analysed. (8)
- 6 a) Define spirometry. List any 2 desirable characteristics of a spirometer. (2)
- b) Explain any two types of spirometer used. (6)
- c) Explain the working of a Heart Lung machine with relevant figures. (7)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the basic principle of diagnostic radiology with a neat diagram. (4)

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- b) Explain the principle and any one application of M-mode display in ultrasound systems. (6)
- c) With the help of neat block diagram, explain the components of biotelemetry system. (10)
- 8 a) With a neat block diagram, explain the basic pulse-echo system of diagnostic ultrasound. (12)
- b) Explain about the precautions to be taken to prevent electric shock hazards. (3)
- c) State any 5 applications of biotelemetry. (5)
- 9 a) With a neat block diagram, explain the technique of producing CT images. (8)
- b) What is the significance of Compton effect in CT image reconstruction? (2)
- c) Explain the components of an NMR imaging system with neat block diagram. (10)
