

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – IV-EXAMINATION – WINTER 2015

Subject Code: 3341703**Date: 04/12/2015****Subject Name: Biomedical Instrumentation****Time: 02:30 PM TO 5:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** Answer any seven out of ten. **14**
1. What is Diagnosis ?
 2. Define : (i) Bio instrumentation.
(ii) Capillaries.
 3. Define: (i) Arteries.
(ii) Veins.
 4. What is ultrasound?
 5. What is CT Scan?
 6. What is dialysis?
 7. What is bio potential?
 8. List Various bioelectric signal ?
 9. What is lead?
 10. Draw ECG waveform.
- Q.2** (a) Explain various ECG Electrodes. **03**
- OR
- (a) Explain respiration rate transducer. **03**
- (b) Describe any one blood pressure transducer. **03**
- OR
- (b) Explain with neat sketch generation of bio potential. **03**
- (c) Draw and explain block diagram of ECG machine . **04**
- OR
- (c) Draw and explain block diagram of EMG machine. **04**
- (d) Describe X-ray machine with neat sketch. **04**
- OR
- (d) Explain working principle of electro surgery machine in detail with diagram. **04**
- Q.3** (a) Explain biological effect of ultra sound. **03**
- OR
- (a) Explain muscle stimulator. **03**
- (b) Draw block diagram of EEG machine. **03**
- OR
- (b) Explain phonocardiograph with waveform. **03**
- (c) Explain echocardiograph with neat sketch. **04**
- OR
- (c) Explain EMG Electrode with neat sketch. **04**
- (d) How does a CT scan work and when is a CT scan used? **04**
- OR

- (d) Draw and explain 10-20 system of placement of electrode. **04**
- Q.4** (a) Draw block diagram of blood cell counter. **03**
- OR
- (a) Explain ultrasonic blood flow meter with neat sketch. **03**
- (b) Explain biofeedback instrumentation. **04**
- OR
- (b) Explain Auto analyzer. **04**
- (c) Draw and explain various ECG leads. **07**
- Q.5** (a) Classify medical instrument based on application and based on biological system. **04**
- (b) Draw Block diagram of hemodialysis machine. **04**
- (c) Describe instrumentation Amplifier. **03**
- (d) Explain Electrical resistance thermometer as a body temperature transducer. **03**
