Seat No.: _____ Enrolment No._____

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**

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