Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA ENGINEERING – SEMESTER – IV • EXAMINATION – SUMMER- 2016

Subject Code: 3341704 Date: 20 -05 - 2016

Subject Name: Bio-medical Instrumentation

Time: 10:30 AM TO 01:00 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. દશમાંથી કોઇપણ સાતના જવાબ આપો. **14**

1. Define biomedical instrumentation.
2. List the Sources of biomedical signals
3. Define bio-potential.
4. Draw an ECG wave with label the segment
5. List any four characteristics of x-ray
6. State the application of electrosurgical unit and hemodialysis machine in the hospital.
7. State the application of blood cell counter and blood gas analyser.
8. State the normal value of heart rate, respiration rate ,body temperature and blood pressure.
9. What type of radiation energy source is utilized in CT scan and ultrasonography.
10. Draw circuit diagram of defibrillator.

Q.2 (a) Explain working of phono- cardiograph **03**

OR

(a) Explain bipolar limb leads used for ECG measurements. **03**

(b) Describe blood cell counter. **03**

OR

(b) Describe precautions to be taken while using an electro-surgery machine. **03**

(c) Describe working of an electro-surgery machine with block diagram. **04**

OR

(c) Explain Einthoven's triangle. **04**

(d) Describe working of a Hemo-dialysis machine with block diagram **04**

OR

(d) Describe working of a Muscle Stimulators machine with block diagram **04**

Q.3 (a) Describe working of a Defibrillator Machine. **03**

OR

(a) Describe precautions to be taken while using Defibrilator Machine. **03**

(b) Draw the block diagram of a blood cell counter . **03**

OR

	(b)	Draw the block diagram of a bio-chemistry analyzer	**03**
	©	Describe working of a bio-chemistry analyzer.	**04**
		OR	
	©	Describe working of a blood cell counter.	**04**
	(d)	Draw the block diagram of an auto analyzer	**04**
		OR	
	(d)	Draw the block diagram a blood gas analyzer	**04**
Q.4	(a)	Describe working of a blood gas analyzer in short.	**03**
		OR	
	(a)	List and Explain the different types of medical transducers used for Body temperature measurement.	**03**
	(b)	Explain the working of Sphygmo-manometer.	**04**
		OR	
	(b)	Classify medical instruments based on Application.	**04**
	©	Explain generation of bio-potential in human body	**07**
Q.5	(a)	Draw and explain generalized block diagram of medical instrumentation system.	**04**
	(b)	Describe working principle of Electrocardiograph with a block diagram.	**04**
	©	Classify medical instruments based on different departments of the hospital.	**03**
	(d)	Draw block diagram of an EMG.	**03**

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