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Reg. No.



#### GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, May – 2021

(Eighth Semester)

# BBTOE8031-BIOMEDICAL INSTRUMENTATION

(Electrical Engineering)

Time: 2 hrs Maximum: 50 Marks

17

## **Answer ALL Questions**

## The figures in the right hand margin indicate marks.

## **PART – A: (Multiple Choice Questions)**

 $(1 \times 10 = 10 \text{ Marks})$ 

Q.1.	Answe	r ALL questions			[CO#]	[PO#]
a.	MRI stands for					1
	(i)	Mechanical Resonance	(ii)	Magnetic Resonance Imaging		
		Imaging				
	(iii)	Mutually Related Imaging	(iv)	Magnetic Resultant Imaging		
b.	From i	nstruments point of view, heart i	s a	system.	1	1
	(i)	pneumatic	(ii)	electric		
	(iii)	electronic	(iv)	hydraulic		
c.	Which	type of transducer requires end	ergy to b	e put into it in order to translate	2	1
	change	es due to the measurand?				
	(i)	active transducers	(ii)	passive transducers		
	(iii)	powered transducers	(iv)	local transducers		
d.	Active	transducers work on the princip	le of	_	2	1
	(i)	energy conversion	(ii)	mass conversion		
	(iii)	energy alteration	(iv)	volume conversion		
e.	The mi	inimum input of physical parame	eter that v	vill create a detectable out change	2	1
	is calle	ed				
	(i)	threshold	(ii)	sensitivity		
	(iii)	span	(iv)	precision		
f.	The reg	gion in which the output does no	t changes	with increase in input is called	2	1
	(i)	input range	(ii)	threshold		
	(iii)	offset	(iv)	saturation		
g.	Which	of the following instrument reco	ords the e	lectrical activity of the heart?	3	1
	(i)	VCG(Vector cardio graph)	(ii)	PCG(Phonocardiograph)		
	(iii)	ECG(Electro cardio graph)	(iv)	EEG		
h.	Who p	rovides valuable information abo	out a wide	e range of cardiac disorders?	3	1
	(i)	VCG	(ii)	ECG		
	(iii)	PCG	(iv)	EEG		
i.	Which	of the following instrument is u	used for r	ecording the electrical activity of	4	1
	the bra	in?				
	(i)	ECG	(ii)	EMG		
	(iii)	PCG	(iv)	EEG		
j.	Which	of the following is material is u	sed to im	prove electrical contact?	4	1
	(i)	Silver Tungsten	(ii)	Electrode jelly		
	(iii)	Silver Graphite	(iv)	Copper Tungsten		

ART – B: (Short Answer Questions)	$(2 \times 5 = 10 \text{ Marks})$		
. Answer ALL questions	[CO#]	[PO#]	
List the Sources of Biomedical Signals.	1	1	
What is the use of Microprocessors in Medical Instruments?	1	1	
List the characteristics of Transducers.	2	2	
Draw the generalized block diagram for Patient Monitoring System.	3	1	
Define Leakage current in biomedical devices.	4	1	
	List the characteristics of Transducers.  Draw the generalized block diagram for Patient Monitoring System.	List the Sources of Biomedical Signals.  What is the use of Microprocessors in Medical Instruments?  List the characteristics of Transducers.  Draw the generalized block diagram for Patient Monitoring System.  [CO#]	

# **PART – C: (Long Answer Questions)**

 $(6 \times 5 = 30 \text{ Marks})$ 

Answ	er ANY FIVE questions	Marks	[CO#]	[PO#]
3.	Explain in detail about Silver-Silver Chloride Electrodes.	(6)	1	1
4.	What are all the general Constraints in Design of Medical Instrumentation Systems?	(6)	1	1
5.	List the different types of transducers and explain the same in briefly.	(6)	2	1
6.	Discuss in detail about Common Impedance Coupling	(6)	2	1
7.	How to measure heart rate of the patients?	(6)	3	1
8.	Discuss about Laser-Doppler Blood Flowmeter operation	(6)	3	1
9.	What is mean by Electric Shock Hazards? How it is prevented?	(6)	4	1
10.	List the Safety Codes for Electro medical Equipment.	(6)	4	1

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