B.E. Instrumentation Engineering (Model Curriculum) Semester-VI

IN602M - Bio-Medical Instrumentation

P. Pages : 2 **GUG/W/23/14029**

Time : Three Hours * 7 6 1 6 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and Chemical equation should be given wherever necessary.
5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What are the problems encountered in measuring living system. Explain in detail? **8**

b) Define following static characteristics-Accuracy, Precision, Hysteresis, Sensitivity, Linearity. **8**
Define following dynamic characteristic-Lag, Speed of response.

OR

2. a) Define Man-Instrument system? Explain in detail components of Man-Instrument system with suitable block diagram? **8**

b) Define following static characteristics-Precision, Hysteresis, Linearity, Resolution, Drift. **8**
Define following dynamic characteristic-Fidelity, Dynamic error.

3. a) Explain following Types of electrodes in detail. **8**
a) PH electrode
b) Microelectrodes.

b) Define the following: **8**
a) Bio-electric potential
b) ERG
c) EOG
d) Absolute Refractory period
e) Half cell potential
f) Perfectly Non-polarizable electrode
g) State all or nothing law
h) Evoked potential.

OR

4. a) Write short note on the following. **8**
a) Resting potential
b) Action potential

b) Explain bioelectric potential generated by heart with its typical waveform? **8**

5.	a)	What are Pacemakers? Differentiate between internal and external pacemakers?	**8**
	b)	A patient subjected to Non-invasive method of Blood flow measurement. Which method would you suggest? What is principle behind the method and how it is done?	**8**

OR

6.	a)	Explain in details methods of Non-invasive BP measurement technique. a) Auscultatory method with Korotkoff sounds. b) Oscillometric method with suitable graphical representation.	**8**
	b)	What is phonocardiogram? Explain in detail different sounds produced by heart?	**8**
7.	a)	List out specification of EEG machine and brain wave classification with its frequency and occurrence?	**8**
	b)	Write short note on: a) Pneumography b) Somatic nervous system.	**8**

OR

8.	a)	Explain the graph related for volume and capacities of lung. Give terms related with it.	**8**
	b)	Explain in detail 10-20 lead system used to record EEG?	**8**
9.	a)	List various electrosurgery technique and explain Electrosurgical diathermy with functional block diagram?	**8**
	b)	Differentiate between Haemo-dialysis and Peritoneal dialysis? What is principle of Ultrasonic imaging?	**8**

OR

10.	a)	Discuss how GFI and LIM devices protect against electrical hazards?	**8**
	b)	What is Computer Tomography? Explain its scanning procedure with complete diagram.	**8**

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