

Visvesvaraya Technological University, Belagavi
CBCS Scheme: 2015-16

MODEL QUESTION PAPER

15EI54

Fifth Semester Electronics & Instrumentation Engineering

BIOMEDICAL INSTRUMENTATION

Time: 3 Hrs

Max. Marks: 80

Note: Answer FIVE FULL Questions, selecting ONE FULL Question from each Module

Question Number	Question	Marks Allotted
	Module -1	
1 a)	With a neat block diagram illustrate the biomedical instrumentation system.	8M
b)	What are the general constraints in design of medical instrumentation system?	2M
c)	How the silver –silver chloride electrode is produced, discuss with necessary equation.	6M
	or	
2 a)	How the Limb and suction cup electrodes can be used for recording of ECG	8M
b)	With necessary diagrams illustrate how the electrical activity is generated due to contraction of one muscle cell.	8M
	Module -2	
3 a)	Why isolated preamplifier is used for bioelectric signal acquisition.	2M
b)	How the 12-lead system can be used for recording of ECG signal from the human body.	10M
c)	Mention any two advantages in using the multichannel ECG machine	4M
	or	
4 a)	What are effects of artifacts on ECG recording?	2M

b)	How the 10-20 electrode system can be used for recording of EEG signal	8M
c)	With a neat block diagram illustrate how the electromyogram is recorded from the human body.	6M
Module -3		
5 a)	With neat block diagram explain the necessary of bedside patient monitoring system.	6M
b)	Briefly discuss about beat to beat to calculation for heart rate measurement.	4M
c)	With suitable diagram illustrate how transmission and reflectance method can be used for measurement of pulse rate.	6M
or		
6 a)	With neat diagram explain Rheographic method of indirect blood pressure measurement.	8M
b)	With suitable diagram discuss how CO ₂ is detected in the expired air for continuous monitoring of respiration rate.	8M
Module -4		
7 a)	Discuss with necessary diagram Doppler Imaging system for blood flow measurement.	8M
b)	Define Cardiac output?	2M
c)	Explain the measurement of continuous cardiac output derived from the aortic pressure waveform.	6M
or		
8 a)	What is the need of cardiac pacemaker and Defibrillator?	4M
b)	Mention any three basic requirements for implantable pacemaker.	4M
c)	Discuss about a power sources of implantable pacemaker.	8M
Module -5		
9 a)	What is the importance of pump oxygenator?	2M
b)	Explain the process of Hemodialysis.	8M
c)	Discuss about Lithotripsy.	6M

	or	
10 a)	Describe any four effects of electric current on the human body.	8M
b)	Mention any eight precautions to minimize electric shock hazards.	8M