



## End Semester Examination – Nov/Dec – 2016

Code : **14EI3033**  
Sub. Name : **Biomedical sensors and signal conditioning**

Semester : **2016-17 ODD**  
Duration : **3hrs**  
Max. marks : **100**

### ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Design a instrumentation amplifiers for blood pressure telemetry	CO3	10
	b.	Illustrate with examples, General-purpose non-linear electronic circuits involved in biomedical applications	CO1	10
(OR)				
2.	a.	A simple pacemaker is made with two multivibrators connected in series. The first one is an astable multivibrator, the second one is a monostable multivibrator. The output is taken from the monostable multivibrator. Discuss these two types of multivibrator and the rationale of them connected in series.	CO1	20
3.	a.	Design an amplifier circuit for defibrillator.	CO3	10
	b.	Describe the functional block diagram of electrocardiograph and list the problems while acquiring ECG signal	CO2	10
(OR)				
4.	a.	Discuss the frequency domain model for band pass and band stop filter	CO1	10
	b.	Design an active filter amplifier design for EMG signal	CO3	10
5.	a.	Discuss amplifier selection for various biomedical sensors.	CO3	10
	b.	Design a Wheatstone bridge amplifier design for ECG signal	CO2	10
	c.			
(OR)				
6.	a.	Draw an embedded system design which measure hemoglobin and explain the functionality of each block.	CO2	15
	b.	Give the importance of Transducer bridge Amplifier in biomedical applications	CO2	5
7.	a.	Design a Low pass filter in frequency domain with cutoff frequency of 1KHz	CO1	15
	b.	List the requirement of bio amplifier	CO1	5
(OR)				
8.	a.	Design a Front-end analogue circuit for EMG signal	CO2	15
	b.	Justify why oscillator circuits are required for biomedical application	CO1	5
<b><u>Compulsory:</u></b>				
9.	a.	Design a Front-end analogue circuit design for limb movement sensing	CO2	15
	b.	Comment on the significance of instrumentation amplifier in biomedical applications	CO1	5

ALL THE BEST