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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- VII (New) EXAMINATION - WINTER 2019

Subject Code:	2171102		Date: 05/12/2019
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Subject Name: Biomedical Instrumentation

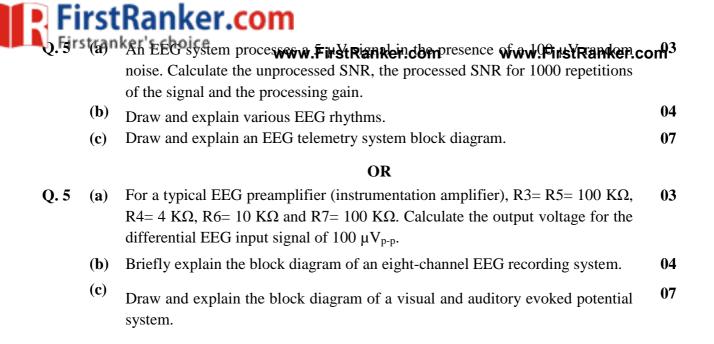
Time: 10:30 AM TO 01:00 PM	Total Marks: 70
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Instructions:

1.	Attempt	all d	questions.
1.	Aucinpu	an	questions.

- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

Q. 1	(a)	Define the terms: Action Potential and Resting Potential.	03
	(b)	With neat figures, explain the depolarization and repolarization process.	04
	(c)	Draw and thoroughly explain the generalized medical instrumentation system.	07
Q. 2	(a)	What is an electrode? With the help of neat figures, explain needle electrodes.	03
	(b)	Explain in detail the micro-electrodes.	04
	(c)	Explain the following terms with neat figures: Hysteresis, Response time, Sensitivity, Precision	07
		OR	
	(c)	Explain the signal processing tactics for improved sensing.	07
Q. 3	(a)	Explain various noise reduction strategies.	03
	(b)	What is an instrumentation amplifier? State its utilities and applications.	04
	(c)	With the help of neat figure, explain the human heart functioning.	07
		OR	
Q. 3	(a)	What is a biopotential? State various types of biopotentials available from the human body.	03
	(b)	Draw and explain the ECG amplifier with right-leg and shield drive.	04
	(c)	With the help of neat figure, explain the ECG machine mechanism.	07
Q. 4	(a)	Describe the basic approaches for protection against shock.	03
	(b)	With a neat figure, explain the structure of a neuron.	04
	(c)	With the help of neat figures, explain the 12-lead system used in ECG measurement.	07
		OR	
Q. 4	(a)	Explain the organization of the nervous system.	03
	(b)	Discuss physiological effects of electricity and important susceptibility parameters.	04
	(c)	Explain the 10-20 system for EEG recording with neat figures.	07



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