	<u>Uiedh</u>
Name :	
Roll No.:	As Against Williams Said Statement
Invigilator's Signature :	

CS/B.TECH (EIE)/SEP. SUPPLE/SEM-8/EI-801D/2012

2012

BIOMEDICAL AND ECOLOGICAL MEASUREMENTS

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A (Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following:

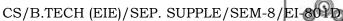
 $10 \times 1 = 10$

- i) Tachycardia means
 - a) slower heart rate
- b) faster heart rate
- c) normal heart rate
- d) none of these.
- ii) the most suitable power sources for a pacemaker is
 - a) nuclear battery
 - b) mercury battery
 - c) lithium battery
 - d) magnetically coupled rechargeable battery.
- iii) Ventricular inhibited pacemaker means
 - a) R wave triggered pacemaker
 - b) R wave blocked pacemaker
 - c) both R wave triggered & blocked pacemakers
 - d) none of these.

SS-404 [Turn over

CS/B.TECH (EIE)/SEP. SUPPLE/SEM-8/EI-801D/2012

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iv)	the natural pacemaker of the heart is				
	a)	SA node	b)	AV node	
	c)	Bundle of His	d)	Purkinje fibre.	
v)	Eut	rophication means			
	a) Thermal change in water				
	b) filling up of water body with aquatic plants due to extra-nourishment				
	c)	solid waste			
	d)	none of these.			
vi)	In the industrial area noise is measured by				
	a)	L_{10} (18hrs) index	b)	$L_{ m eq}$	
	c)	L_eP_n	d)	none of these.	
vii)	Hemoglobin is contained in				
	a)	WBC's	b)	RBC's	
	c)	platelets	d)	protein.	
viii)	Instrument measuring volume changes in any part of the body due to pulsations of blood occurring with each heart beat is				
	a)	plethysmograph	b)	Arithmetic unit	
	c)	Ventilator	d)	Cardiac pacemaker.	
ix)	ix) The triangle whose sides represent the line a				
	3 pı	rojections of ECG are measured is			
	a)	Galvani triangle	b)	Einthoven triangle	
	c)	Abbott triangle	d)	Korotkoff triangle.	
x)	Korotkoff sounds are used in				
	a) blood flow measurements				
	b) blood pressure measurements				
	c) heart valve functioning				
	d) as a reference for sound level measurement				





- xi) 'Radio Pill' is used to monitor
 - a) Stomach pressure
 - b) Cardiovascular pressure
 - c) Arterial pressure
 - d) Veinous pressure.
- xii) The audio sense of a person is most sharp in the frequency range
 - a) 2 5.5 kHz
- b) 7 10 kHz
- c) 12 15 kHz
- d) 17 20 kHz.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

 $3 \times 5 = 15$

- What is ECG? Draw the ECG waveform, labelling the critical features including typical amplitudes & time intervals for a normal person.
- 3. Write down the Nernst equation. Give brief description on electrodes that are used to measure bio-electric potentials.

3 + 2

- 4. Write down the working principle of ultrasonic blood flow metres.
- 5. Explain activated sludge process of waste treatment process.

5

6. Describe the principle of CAT. Compare its method of visualisation with conventional X-Ray methods. 3 + 2

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GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following.

 $3 \times 15 = 45$

- 7. a) Define polarization, depolarization & repolarization.
 - b) Write down the pressure transducers used for biomedical application.
 - c) Describe briefly about metal & micropipet microelectrodes. 6+3+6
- 8. a) Describe briefly about different types of method of invasive technique for blood pressure measurement.
 - b) What do you mean by fibrillation? State the different types of fibrillation compare ac & dc defibrillation.
 - c) Explain the operation of pacemaker. 6 + 2 + 1 + 2 + 4
- 9. a) Explain with a neat sketch, the operation of dissolved oxygen measurement system.
 - b) What is smog?

3

- c) Write short note on 'Los Angeles Smog'
- d) Discuss briefly about the effect of Global Warming.

6 + 2 + 3 + 4

- 10. a) Briefly describe the principle of generation of X-Ray.
 - b) What are the visualization techniques of X-Rays?
 - c) Discuss about the physiological effect of electrical current. 5+5+5
- 11. Write short notes on any three of the following:

 3×5

- a) Electrostatic precipitator
- b) Biotelemetry
- c) CT
- d) Patient care monitoring unit.
- e) ECG Amplifier.