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<i>Io.</i> :	•••••	•••••		In Agency (y' Exercisely) and Explained
Invigilator's Signature :				
CS/B.Tech(EIE)/SEPARATE SUPPLE/SEM-8/EI-801D/2011				
2011				
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 the following:				
				$10 \times 1 = 10$
i)	Faster heart rate is known as			
	a)	Bradycardia		
	b)	Trachycardia		
	c)	Dralycardia		
	d)	None of these.		
ii)	Gas	which is responsible for	r acid	l rain is
	a)	CO ₂	b)	SO ₂
	Jo.: lator S/B. CMI Allot dida	Io.: lator's Sign S/B.Tech S/B.T	lator's Signature:	S/B.Tech(EIE)/SEPARATE SUPPLE/ 2011 DMEDICAL AND ECOLOGICAL Allotted: 3 Hours The figures in the margin indical didates are required to give their answas far as practical as far as practical as far as practical as far as practical form. GROUP - A (Multiple Choice Type Quechoose the correct alternatives for the sillow) Faster heart rate is known as a) Bradycardia b) Trachycardia c) Dralycardia d) None of these. ii) Gas which is responsible for acid

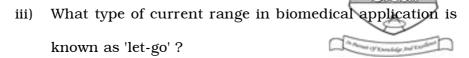
SS-245 [Turn over

d) CO.

 $^{
m CH}_4$

c)

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- a) 1 5 mA
- b) 5 8 mA
- c) 8 20 mA
- d) > 20 mA.
- iv) The number of electrodes required to record an electrocardiogram is usually
 - a) 6

b) 12

c) 5

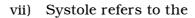
- d) None of these.
- v) Unit of X-Ray is
 - a) Curie

b) Volt

c) Farad

- d) None of these.
- vi) The character wavelength of absorption of infrared of CO $_{2}\,$ gas is
 - a) 4.8 micro meter
 - b) 4.8 mm
 - c) 8.8 micro meter
 - d) 4.8 nm.





- a) Maximum blood pressure
- b) Minimum blood pressure
- c) Maximum blood flow
- d) Minimum blood flow
- e) None of these.

viii) Normal action potential in the heart originates from

- a) Sinoartrial Node
- b) Vasomotor centre
- c) Purkinje fibre
- d) Atrioventricular node
- e) None of these.

ix) The transducer for phonocardiogram is

- a) Microphone
- b) Strain gauge
- c) LVDT
- d) Piezoelectric transducer.
- e) None of these.





- x) The valve right ventricle is known as
 - a) Mitral
 - b) Aortic
 - c) Pulmonary
 - d) Tricuspid.

GROUP - B

(Short Answer Type Questions)

Answer any three of the following.

 $3 \times 5 = 15$

- 2. What is Electroencephalography? List the brain waves and their frequencies. 3+2
- 3. What are the types of measurements of blood pressure? How is the blood pressure measured in the indirect method? 1+4
- 4. Explain the principle of sphygmomanometer.
- 5. Give the characteristics *X*-Ray radiation. What is meant by soft and hard *X*-Ray? $2 + 1\frac{1}{2} + 1\frac{1}{2}$
- 6. Name two ways in which electricity can harm the body. List the various effects of current that occur with increasing current intensity. 2+3

4

SS-245

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(Long Answer Type Questions)

Answer any three of the following.

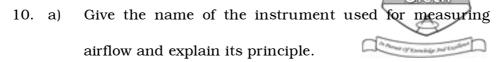


- 7. a) What are the methods involved in indirect blood pressure measurement?
 - b) What is meant by mean arterial pressure (MAP)?
 - c) Explain the two ways involved in measurement of blood pressure with a catheter ?
 - d) Describe some possible uses of EMG?
 - e) What is meant by ultrasonic imaging?

3 + 2 + 5 + 3 + 2

- 8. a) List some advantages and disadvantages of Biotelemetry.
 - b) Draw a block diagram to send an Electrocardiogram from an ambulance to a hospital by telemetry.
 - c) What are medical transmitting frequencies? 4 + 9 + 2
- 9. a) What are the different modes of operation of differential amplifier? Explain.
 - b) What is CMRR and SLEW Rate in a differential amplifier?
 - c) What is noise figure?
 - d) What is Offset Voltage?
 - e) Write the characteristic of an ideal op-amp (no description needed). 4+4+2+2+3

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- b) Define MVV.
- c) What is FVC?
- d) What is FRC?
- e) Differentiate between tidal volume and residual volume
- f) Define total lung capacity. 5 + 2 + 2 + 2 + 2 + 2
- 11. a) What is a defibrillator?
 - b) Explain ventricular fibrillation and how can it be eliminated?
 - c) What are the different types of defibrillators?
 - d) What are the applications of ventricular inhibited pacemaker?
 - e) Explain different lead systems for recording ECG.

$$2 + 2 + 2 + 2 + 7$$





12. Write short notes on any three of the following:

a) Sound Level Meter

b) Pacemaker

c) Plethysmography

d) Causes of global warming and its effects.

SS-245 7 [Turn over