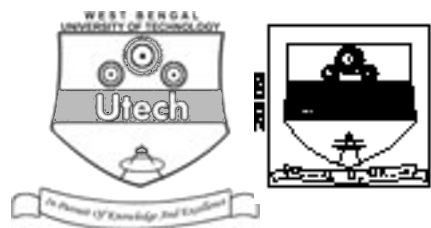


**BIO-MEDICAL AND ECOLOGICAL MEASUREMENT ( SEMESTER - 8 )**

**CS/B.TECH ( EIE-NEW )/SEM-8/EI-801D/09**



1. ....  
Signature of Invigilator

2. ....  
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the  
Candidate

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**CS/B.TECH ( EIE-NEW )/SEM-8/EI-801D/09**

**ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009**

**BIO-MEDICAL AND ECOLOGICAL MEASUREMENT ( SEMESTER - 8 )**

Time : 3 Hours ]

[ Full Marks : 70

**INSTRUCTIONS TO THE CANDIDATES :**

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.  
b) For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

**No additional sheets are to be used and no loose paper will be provided**

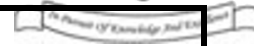
**FOR OFFICE USE / EVALUATION ONLY**

Marks Obtained

	Group – A										Group – B					Group – C					Total Marks	Examiner's Signature
Question Number																						
Marks Obtained																						

.....  
**Head-Examiner/Co-Ordinator/Scrutineer**

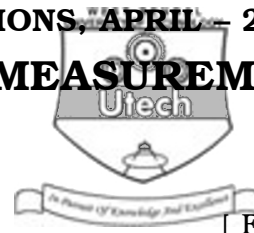
**8852-D/D (25/04)**



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**ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009**  
**BIO-MEDICAL AND ECOLOGICAL MEASUREMENT**  
**SEMESTER - 8**



Time : 3 Hours ]

[ Full Marks : 70

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) What type of current range in bio-medical application is known as 'Let-go' ?

a) 1 – 5 mA

b) 5 – 8 mA

c) 8 – 20 mA

d) > 20 mA.

ii) Faster heart rate is known as

a) tachycardia

b) bradycardia

c) dralycardia

d) none of these.

iii) Normal action potential in the heart originates from

a) Sinoatrial node

b) Vasomotor centre

c) Atrioventricular node

d) Purkinje fibre

e) none of these.

iv) Unit of X-ray is

a) Roentgen

b) Curie

c) Volt

d) Farad

e) None of these.



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v) The gas which is responsible for acid rain is

a)  $\text{SO}_2$ b)  $\text{CO}_2$ 

c) CO

d) Methane

e) none of these.



vi) Systole refers to the

a) maximum blood pressure

b) minimum blood pressure

c) maximum blood flow

d) minimum blood flow

e) none of these.

vii) The characteristic wavelength of absorption of infrared of  $\text{CO}_2$  gas isa)  $4.8 \mu\text{m}$ b)  $4.8 \text{ mm}$ c)  $4.8 \text{ nm}$ d)  $8.8 \mu\text{m}$ .

viii) The number of electrodes required to record an electrocardiogram is usually

a) 6

b) 12

c) 5

d) none of these.

ix) The transducer for phonocardiogram is

a) LVDT

b) micro phone

c) strain gauge

d) PZT

e) none of these.

x) X-ray imaging combined with computer techniques is known as

a) EMG

b) CT

c) USG

d) EEG.

xi) The valve at right ventricle is known as

a) Mitral

b) Pulmonary

c) Aortic

d) Tricuspid.



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**GROUP – B****( Short Answer Type Questions )**Answer any *three* of the following.

3 × 5 = 15

2. Discuss the transducers for blood pressure measurement. 5
3. What is 'Smog' ? Write notes on 'Los Angeles Smog'. 2 + 3
4. Define 'Aerosol'. With a suitable diagram explain, the working principle of electrostatic precipitator. 2 + 3
5. Explain the principle of CAT and compare its method of visualisation with conventional X-ray methods.
6. What do you mean by Doppler effect ? How is it applied in blood flow measurement ?

**GROUP – C****( Long Answer Type Questions )**Answer any *three* of the following questions.

3 × 15 = 45

7.
  - a) What do you mean by fibrillation ? What are different types of fibrillation ?
  - b) What are the disadvantages of a.c. defibrillator ? How can these be removed by using d.c. defibrillator ? Explain with corresponding circuit.
  - c) What is a 'Pacemaker' ? How can pacemaker be classified ? Write the different pacing modes. 3 + 7 + 5
8.
  - a) How many types of electrodes are there in Bio-medical Instrumentation ? Discuss them in detail.
  - b) How can the noise of Bio-potential measurement be eliminated ? 10 + 5
9. What is 'Threshold of Hearing' ? Define sound intensity level. Name five primary and five secondary risk factors for hearing loss. Draw block diagram of a sound level Metre and explain its working principle. 2 + 2 + 5 + 6



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10. a) How X-ray is generated normally ?
- b) What are the main disadvantages of fixed anode tube ? How can it be overcome by using rotating anode tube ?
- c) What are the main limitations of 1st, 2nd and 3rd generation ? How is it overcome in 4th generation ?
11. Write short notes on any *three* of the following :
- i) Phethysmography
- ii) MRI
- iii) Indirect method of blood pressure measurement
- iv) Causes of global warming and its effect.



5 + 3 + 7

3 × 5

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END