BIOPHYSICS (SEMESTER - 4)

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CS/B.TECH (BME)/SEM-4/BME-403/09

1.	Signature of Invigilator	Utech Utech										
2.	Reg. No. Signature of the Officer-in-Charge Roll No. of the Candidate											
	CS/B.TECH (BM ENGINEERING & MANAGE) BIOPHYSIC	MENT	EXA	MINA	ATIO	NS, .	JUNI	 E - 2				
Tir	ne : 3 Hours]								[Fı	ıll M	arks	: 70

INSTRUCTIONS TO THE CANDIDATES :

- This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this 1. concerned subject commence from Page No. 3.
- In **Group A**, Questions are of Multiple Choice type. You have to write the correct choice in the box 2. a) 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.
- Fill in your Roll No. in the box provided as in your Admit Card before answering the questions. 3.
- 4. Read the instructions given inside carefully before answering.
- You should not forget to write the corresponding question numbers while answering. 5.
- Do not write your name or put any special mark in the booklet that may disclose your identity, which will 6 render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
- Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall. 7.
- You should return the booklet to the invigilator at the end of the examination and should not take any 8 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

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		Marks Obtained										
	Group – A					Group – B			up – C			
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Number									1	Marks	Signature	
Marks												
Obtained												

Head-Examiner/Co-Ordinator/Scrutineer







Full Marks : 70

 $10 \times 1 = 10$

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

BIOPHYSICS

3

SEMESTER – 4

Time : 3 Hours

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

- i) Which of the following is not a radio isotope ?
 - a) ${}^{14}C$ b) ${}^{32}P$
 - c) 131 I d) 14 N.
- ii) Which of the following is an ultrasonic wave detector ?
 - a) cesium iodide b) thermocouple
 - c) piezoelectric crystal $(d) \ge 0$ none of these.

iii) Phonocardiography technique is used to

- a) record the electrical activity of heart
- b) record the respiratory function
- c) record the heart sound
- d) none of these.

iv) Fluorescence occurs when

- a) emitted light has longer wavelength than absorbed light
- b) emitted light has equal wavelength of absorbed light
- c) emitted light has shorter wavelength than absorbed light

d) emitted light has complete absorption.

CS/B.TECH (BME)/SEM-4/BME-403/09

4

- V) Indian Standard for safety codes for electromedical equipment has been issued by IEC b) ISO a) BIS d) USP. c) In case of atrial flutter vi) interval between T and P waves completely disappears a) interval between P and Q waves completely disappears b) interval between *S* and *T* waves completely disappears c) d) none of these. In ECG vector cardiography the first vector represents vii) atrial depolarization a) spike potential b) ventricular depolarization c) d) none of these. α , β , θ , δ waves are recorded in viii) a) electro-occulogram electro-encephalogram b) electro-cardiagram all of these. c) d) The proportion of light transmitted (I/I_0) is called the ix) transmittance absorbance a) b)
 - none of these. c) optical density d)
 - An example of a biological transducer is X)
 - blood cochlea a) b)
 - c) brain d) tongue.

 $3 \times 5 = 15$

GROUP – B

(Short Answer Type Questions)

Answer any three of the following questions.

- What are the main electrolytes present in biological fluid ? Briefly explain a procedure for the determination of conduction of biological fluid.
 1 + 4
- 3. Briefly discuss the bipolar limb-lead system for ECG measurement. What are the parameters used for the diagnosis of ECG signal ? 3+2
- 4. What are the main properties of ultrasound ? What are the specifications of medical (diagnostics) ultrasound?
 4 + 1
- 5. Explain the medical significance of α and γ waves in EEG. 5
- 6. Write short notes on "application of biometric in modern technology". 5

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following questions. $3 \times 15 = 45$

- 7. Define radioactivity with the help of law of radioactive decay. How can you detect and measure the intensity of radioactivity ? What is electromagnetic radiation ? What is the photoelectric process and significance in radiology ? 5 + 5 + 1 + 4
- 8. Describe the technique for determination of EMF of a single biological cell. What do you mean by impedance of biological system ? Explain any two methods used to measure the impedance of body. 4 + 3 + 8
- 9. What do you mean by macroshock and microshock in the physiological measurement ? What is "Let go current" ? Briefly discuss the magnetic properties of biological substances. Give brief outlines of merits and demerits of magnetic field and radio waves in the biological system. 4 + 1 + 4 + 6

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10. What is the electrical activity of human brain ? Briefly discuss about the recording electrodes of EEG signals. Do you think that the electroencephalogram is subject to frequency discrimination ? Explain. What is electroretinography ? 2 + 6 + 4 + 3

6

- 11. How can you measure the concentration (solute) of a solution by using Beer-Lambert law ? Give a schematic diagram of the instrumental procedure. What are the main electrolytes present in biological fluid ? Briefly discuss a procedure for measuring the electrical conductance of biological fluid. 3 + 5 + 1 + 6
- 12. What do you understand by vector cardiography ? With the help of vector cardiography explain the flow of electrical impulse in the heart. What are the different types of electrocardiographic leads ? With the help of a suitable diagram, explain the position of the leads. 3 + 5 + 3 + 4

END