



B.E DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Fifth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEE0017: Biomedical Instrumentation

COURSE OUTCOMES

- CO1:** Understand the fundamentals of Biomedical Engineering.
CO2: Understand the measurement and diagnosis of non-electrical parameters.
CO3: Gain knowledge on various sensing and measurement of electrical parameters.
CO4: Acquire the basic principles in imaging techniques.
CO5: Understand the medical assistance/techniques, robotic and therapeutic equipments.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|--|-----|-------------------|
| 1. Define resting and action potential. | CO1 | [K ₁] |
| 2. List the factors that are considered in the design of biomedical instrument system. | CO1 | [K ₂] |
| 3. Define cardiac output and total lung capacity. | CO2 | [K ₂] |
| 4. Differentiate between Systolic Pressure and Diastolic Pressure. | CO2 | [K ₂] |
| 5. Write the different types of Surface electrodes. | CO3 | [K ₂] |
| 6. List the names and frequency bands of EEG signals. | CO3 | [K ₂] |
| 7. Enlist the various biotelemetry systems. | CO4 | [K ₂] |
| 8. List the basic components of X-Ray Machine. | CO4 | [K ₁] |
| 9. Define audiometers and list its types. | CO5 | [K ₁] |
| 10. Justify the importance of nano robots in biomedical industry. | CO5 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|---|----|-----|-------------------|
| 11. a) Explain with a neat diagram the structure of a human cell. | 12 | CO1 | [K ₁] |
| b) Sketch the important parts of cardio vascular system. | 4 | CO1 | [K ₂] |

12.	a)	With a neat sketch, explain the Nerve cell and its functions.	12	CO1	[K ₁]
	b)	Identify the various types of transducers used in Biomedical engineering.	4	CO2	[K ₂]
13.	a)	Define Oximeter. Explain fingertip oximeter with a neat diagram.	6	CO2	[K ₂]
	b)	Identify the instrument used for pulmonary function test and explain its working with a neat block diagram.	10	CO2	[K ₂]
14.	a)	Discuss the genesis of ECG and explain the working of an ECG machine.	8	CO3	[K ₂]
	b)	Explain with a neat diagram the working of EEG.	8	CO3	[K ₂]
15.	a)	With a neat diagram Explain the principle of operation of MRI.	10	CO4	[K ₂]
	b)	Enumerate on Computer Tomography with relevant block diagram.	6	CO4	[K ₂]
16.	a)	Describe the working of electronic pacemaker with necessary diagram.	8	CO5	[K ₂]
	b)	Define defibrillators and Explain with a neat diagram the working any one type of defibrillator.	8	CO5	[K ₂]
