



# MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi &amp; Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade &amp; Recognized Under Section 2(f) &amp; 12(B) of the UGC act, 1956

IV B.Tech I Sem Regular End Examination, Nov/Dec 2022

## Fundamentals of Biomedical Applications (OE-II)

(ECE)

Time: 3 Hours.

Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

### PART- A

(10\*2 Marks = 20 Marks)

- |       |  |    |     |     |
|-------|--|----|-----|-----|
| 1. a) | Find the output of an instrument for the displacement of 30mm if the sensitivity of it is 5mV/1mm. | 2M | C01 | BL3 |
| b)    | List out the electrolytes present in a cell under resting conditions                               | 2M | C01 | BL1 |
| c)    | Differentiate faded and non-faded display devices.   | 2M | C02 | BL2 |
| d)    | Draw Einthoven triangle and label it.  | 2M | C02 | BL1 |
| e)    | Obtain the Mean arterial pressure of a subject whose BP is measured as 130/90 of mmm of Hg         | 2M | C03 | BL3 |
| f)    | Define doppler shift.  | 2M | C03 | BL1 |
| g)    | What is the response of electricity to a muscle and how it is used for defibrillation?             | 2M | C04 | BL1 |
| h)    | Classify pacemakers.   | 2M | C04 | BL2 |
| i)    | State the role of Neurotransmitters in muscle contraction.   | 2M | C05 | BL3 |
| j)    | State the normal values of Tidal volume, Total lung capacity.                                      | 2M | C05 | BL3 |

### PART- B

(10\*5 Marks = 50 Marks)

- |      |  |    |     |     |
|------|--|----|-----|-----|
| 2 a) | Draw the block diagram of a medical instrument and explain.          | 5M | C01 | BL3 |
| b)   | Explain about the generation of Action Potential with a neat sketch. | 5M | C01 | BL4 |

OR

- |      |  |    |     |     |
|------|--|----|-----|-----|
| 3 a) | Discuss in detail about the dynamic characteristics of medical instruments.              | 5M | C01 | BL2 |
| b)   | Write Nernst equation and mention how its relevant to the generation of action potential | 5M | C01 | BL1 |

- |      |   |    |     |     |
|------|---|----|-----|-----|
| 4 a) | Explain about the principle of operation of PMMC writing system.  | 5M | C02 | BL4 |
| b)   | Draw the normal ECG waveform and explain the various segments of ECG and mention the clinical significance. | 5M | C02 | BL1 |

OR

- 5 a) Explain the biochemical interaction of electrodes. 5M C02 BL4  
b) Draw the block diagram of ECG recorder and explain. 5M C02 BL4
- 6 a) Describe the indirect method of Blood Pressure measurement with a neat sketch. 5M C03 BL2  
b) State which of the methods of indirect method BP measurement is accurate and justify. 5M C03 BL3
- OR**
- 7 a) Mention about applications of blood flow meters. 5M C03 BL1  
b) Draw the block diagram of ultrasound blood flowmeter and explain. 5M C03 BL4
- 8 a) Discuss in detail about the rare responsive pacemaker. 5M C04 BL2  
b) Explain the principle of operation of peritoneal dialysis. 5M C04 BL4
- OR**
- 9 a) Differentiate hemodialysis and peritoneal dialysis 5M C04 BL2  
b) List out the applications of electrotherapy 5M C04 BL1
- 10 a) Draw the EEG waveform and mention the characteristics. 5M C05 BL1  
b) Explain about the estimation of nerve conduction velocity. 5M C05 BL4
- OR**
- 11 a) Mention about the principle of operation of pneumotachometer. 5M C05 BL1  
b) Explain about the BiPAP mode operation of a ventilator. 5M C05 BL4

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CO-Course Outcome

BL - Blooms Taxonomy Levels