**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(MID SEMESTER EXAMINATION SP/2025)**

**CLASS: BTECH** **SEMESTER :**
**BRANCH: BIOTECHNOLOGY** **SESSION : SP/2025**

**SUBJECT: BE319 BIOELECTRONICS CONCEPTS AND INSTRUMENTATION**

**TIME: 02 Hours** **FULL MARKS: 25**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 5 marks and total 25 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

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| Q.1(a) | Explain the difference between external and internal respiration | [2] | 1 | 2 |
| Q.1(b) | With the help of suitable diagrams, describe the gas exchange process at pulmonary and cellular levels | [3] | 1 | 2 |
| Q.2(a) | Enlist the roles of urinary system and the hormones involved in it. | [2] | 1 | 1 |
| Q.2(b) | Draw the different parts of a nephron and explain their roles. | [3] | 1 | 1 |
| Q.3(a) | Describe the role of ATP in muscle contraction with the help of suitable diagram. | [2] | 1 | 2 |
| Q.3(b) | Draw and explain the different bands in muscle filaments. | [3] | 1 | 1 |
| Q.4(a) | Draw the circuit diagram of a photo plethysmograph and explain its working. | [2] | 2 | 2 |
| Q.4(b) | Describe the indirect method of blood pressure measurement in detail. | [3] | 2 | 2 |
| Q.5(a) | What is an Einthoven triangle and what it is used for? | [2] | 2 | 2 |
| Q.5(b) | What are Unipolar limb leads? What are they used for? | [3] | 2 | 2 |

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