

**M. Tech.-IV (Electronics V.L.S.I.) (CBCS – 2015 Course) :
SUMMER - 2019**

SUBJECT: SELF-STUDY PAPER-II: BIOMEDICAL INSTRUMENTATION

Day: Thursday
Date: 13/06/2019

S-2019-3488

Time: 11.00 AM TO 02.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answer to both the sections should be written in **SAME** Answer book.
- 4) Draw neat labeled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 What is cell, Tissue and organ? Name the various types of tissues and organs. Explain any two tissues and organs. **(10)**

OR

Q.1 Draw the diagram of heart and explain circulatory system. Name the heart valves and part of the heart. **(10)**

- Q.2**
- a) What is the use of Einthoven triangle in ECG? State Einthoven law. **(04)**
 - b) Draw the standard ECG signal and label all waves along with amplitudes and time duration. **(06)**

OR

- Q.2**
- a) What are the augmented limb leads in ECG? Explain it with neat diagrams. **(06)**
 - b) How the ECG signal is generated in the heart? Write its steps. **(04)**

Q.3 List the Indirect blood pressure measurement techniques. Explain ultrasonic Doppler shift method with neat diagram. Also write the frequency range for the same. **(10)**

OR

Q.3 Describe with suitable diagram H₂O manometer. Why H₂O is used in place of mercury for monitoring the blood pressure invasively? **(10)**

SECTION-II

Q.4 What are the various respiratory volumes and respiratory capacities of the lungs? Describe all these parameters with their values. **(10)**

OR

Q.4 What are the types of plethysmograph? List the parameters for which it is used. Explain plethysmograph with block diagram. **(10)**

- Q.5**
- a) Mention the name of the department in which blood tests are carried out in the hospital. What are the blood components? List the types of blood tests. **(05)**
 - b) Explain the electrodes used to monitor blood PO₂.

OR

Q.5 What are the essential components of typical spectrophotometer? What are the requirements of spectrophotometer while selecting optical filters? **(10)**

Q.6 State the electro surgery techniques and explain electrodes used for surgical diathermy with diagrams. **(10)**

OR

Q.6 What are the safety aspects in electro surgical unit? Discuss high frequency current hazards and explosion hazards. **(10)**

* * * * *