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B.Tech. (Instrumentation & Control Engg.) (2012 Onwards) (Sem.-7)**BIO-MEDICAL INSTRUMENTATION****Subject Code : EI-404****M.Code : 58047****Time : 3 Hrs.****Max. Marks : 60****INSTRUCTION TO CANDIDATES :**

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A**1. Answer briefly :**

- a) What are the requirements of amplifiers used in biomedical recorders?
- b) How is EINTHOVEN TRIANGLE used in ECG measurement?
- c) List different types of EEG waveform and their frequency range.
- d) What is meant by sodium pump during depolarization?
- e) What is defibrillator and list its types?
- f) Discuss the properties of ultrasound and list the modes of ultrasonic imaging.
- g) List the applications of telemedicine.
- h) What is the use of GSR measurement?
- i) Define Systolic and diastolic pressure.
- j) What do you mean by CT scan?

SECTION-B

2. Briefly explain the action of thermistor as temperature and respiration measurement.
3. With the action potential waveform, summarize depolarization, repolarization and absolute and relative refractory periods.
4. With a neat block diagram explain the working of an EEG machine and electrode placement.
5. Explain the operation of DC defibrillator.
6. With necessary diagrams explain the different display modes used in ultrasonic imaging systems.

SECTION-C

7.
 - a) Describe the different waves of ECG with its significance. Also explain the ECG electrode placement.
 - b) Explain the construction and working principle of X-ray machine.
8.
 - a) Write the construction and working principle of phono-cardiography.
 - b) What are known as “Korotokoff sound”? How will you measure them with an indirect method of measurement?
9. Write short note on followings :
 - a) Plethysmography
 - b) Nuclear Medicine

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.