



**FIFTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)**

**END SEMESTER EXAMINATIONS, DEC- 2017**

**SUBJECT: BIOMEDICAL INSTRUMENTATION [ICE 3102]**

Time: 3 Hours

MAX. MARKS: 50

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- 1A.** With the help of neat sketches explain any one type of body surface electrode and any one type of needle electrode. **5**
- 1B.** Define the terms: i) motion artefact ii) lead iii) resting potential **3**
- 1C.** Bring out the difference between delta wave and theta wave of recorded EEG. **2**
- 2A.** Draw the block diagram and explain the working of ECG machine. **5**
- 2B.** Draw the block diagram of atrial programmed pacemaker and explain its working. **3**
- 2C.** Explain how a pacemakers is different from a defibrillator. **2**
- 3A.** Draw the circuit diagrams and compare the differences and similarities of DC defibrillator and rectangular wave defibrillator. **5**
- 3B.** What is Extracorporeal dialysis? Explain the principle of dialysis in artificial kidney. **3**
- 3C.** Define the following terms with respect to respiratory measurements. **2**
  - a) tidal volume
  - b) the residual volume
  - c) dead space
  - d) spirogram
- 4A.** Draw the block diagram of a digital real time ultrasonic scanner and explain its working. **5**
- 4B.** Draw the block diagram of Doppler type ultrasonic blood flow meter and explain briefly. **3**
- 4C.** What is the difference between in vitro and in vivo oximetry? Mention the methods used. **2**
- 5A.** What is lithotripsy? Explain the various steps involved in extracorporeal shock wave lithotripsy. **4**
- 5B.** Draw the block diagram and explain the different elements of an intensive care monitoring system. **3**
- 5C.** Write a note on: i) endoscopes ii) Magnetic resonance imaging **3**