

MANIPAL INSTITUTE OF TECHNOLOGY Manipal University

SIXTH SEMESTER B.Tech. (I & C E) DEGREE END SEMESTER EXAMINATION May/June 2016

SUBJECT: BIOMEDICAL INSTRUMENTATION (ICE -322)

TIME: 3 HOURS Instructions to candidates

MAX. MARKS: 50

- Answer **ANY FIVE** full questions.
- Missing data may be suitably assumed.
- 1A. Explain the working of Man Instrument system in detail with a block diagram
- 1B. What is synapse? Explain following with respect to a synapse
 - a. Mechanism of synaptic transmission
 - b. Properties of synapse
- 1C. Define i) Polarization ii) Resting Membrane Potential iii) Repolazation iv) Depolarization

(5+3+2)

(5+3+2)

- 2A. Explain the working of Electrocardiograph with block diagram
- 2B. Briefly explain the method of 10-20 electrode placement system with necessary diagram
- 2C Discuss in detail about i) EEG types ii) Sleep cycle
- 3A. What is pacemaker? Classify the pacemaker based on the mode of operation. Explain the working of Atrial synchronous pacemaker with its block diagram.
- 3B. Explain the process of dialysis which uses abdominal cavity as an artificial kidney.
- 3C. Define i) Residual Volume ii) Vital capacity iii) Functional Residual Capacity iv) Expiratory volume with necessary sketch.

(4+3+3)

- 4A. Explain the working of Electromagnetic blood flow meter.
- 4B Explain the functions of different blocks of MRI instrumentation with a neat sketch.
- 4C Draw the diagram of X-ray tube and label its parts.

(4+3+3)

- 5A. Explain the working of Pump-oxegenator type Heart-Lung Machine.
- 5B. Describe the working of different components of Bed side monitoring system.
- 5C Discuss the working of oxygenator and classify the oxygenators.

(5+3+2)

- 6A. Discuss in detail about the functions of various components of CT scanner with its block diagram.
- 6B. Explain i) Basic modes of US transmission ii) Different types of waveforms used in stimulators.
- 6C What is arrhythmia? Explain various types of arrhythmias.

(5+3+2)