



MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)
END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2019

SUBJECT: BIOMEDICAL EQUIPMENTS [ICE 4016]

TIME: 3 HOURS

MAX. MARKS: 50

Instructions to candidates :Answer ALL questions and missing data may be suitably assumed.

- 1A. Explain the terms inspiratory and expiratory reserve volumes with respect to a human lung.
1B. What are the different modes of operation of ventilators? Explain briefly.
1C. With the help of a neat block diagram explain the principle and working of cochlear implants. (2+3+5)
- 2A. Explain how evaluation of air and bone conduction of sound assists the clinical diagnosis of hearing problems.
2B. What are the main elements of a Laser unit? Enumerate the factors that contribute to the Laser properties.
2C. With the help of a neat diagram explain the principle of surgical diathermy. (2+3+5)
- 3A. List any two medical applications of Ruby Laser.
3B. Explain pulse echo system with the help of a neat block diagram. What are its applications?
3C. With the help of a neat block diagram, explain the principle and functioning of artificial kidney. (2+4+4)
- 4A. What are the basic components of lithotripsy machine? Explain each one briefly.
4B. What is an incubator? Explain how proportional controllers are used for controlling temperature in incubators.
4C. What are the basic elements required for intensive care monitoring in cardiac care units? (4+3+3)
- 5A. What is infrared thermography? Mention its advantages.
5B. Describe the different types of infusion pumps.
5C. With the help of a neat block diagram explain the principle and functioning of Coulter counter method for blood cell counting. (2+3+5)
