



MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL
(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)
END SEMESTER DEGREE EXAMINATIONS, DECEMBER - 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. What is the working principle of hot wire anemometer type pneumotachometers?
1B. Briefly explain : i) humidifiers ii) nebulizers iii) aspirators
1C. Explain the principle underlying the hearing aids. With the help of a neat block diagram explain the working of a digital hearing aid. (2+3+5)
- 2A. What is an audiometer? Classify audiometers based on the stimulus used.
2B. Draw neat sketches to explain the various types of electro-surgery techniques.
2C. Draw the block diagram and explain the functioning of convectively-cooled CO₂ laser. (2+3+5)
- 3A. Mention any two medical applications of helium neon Laser.
3B. Use neat sketches to explain the different display modes (scans) used in ultrasonic imaging systems.
3C. With the help of a neat block diagram explain peritoneal dialysis. (2+4+4)
- 4A. What do you mean by heart lung machine? Explain its principle and working.
4B. What are the factors that are required to be monitored in NICU? List the vital equipment in Neonatal intensive care units.
4C. Explain the use of i) Rate meter ii) alarm system iii) Display unit, in CCU. (4+3+3)
- 5A. What is an infusion pump? Why are infusion pumps used?
5B. Explain the basic elements of a thermographic equipment.
5C. Mention the functions of different blood cells in human blood. Explain the principle and functioning of automatic optical method of blood cell counting. (2+3+5)
