Reg. No. | | | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER DEGREE EXAMINATIONS, MARCH - 2021

SUBJECT: BIOMEDICAL EQUIPMENTS [ICE 4016]

TIME: 3 HOURS 19-03-2021 MAX. MARKS: 50

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

1A. What are the essential components of a digital hearing aid? Specify the function of each.

1B. Name the device that measures the instantaneous rate of volume flow of respired gases. Explain different types of this device.

1C. A person has severe difficulty while breathing and needs artificial respiration. Suggest a device to assist the person to breathe. Explain the different modes of operation of the suggested device.

(2+3+5)

2A. Define the terms: i) Lung compliance ii) Airway resistance

2B. Explain the essential set up for producing LASER. Mention any two properties of LASER.

2C. With the help of a neat diagram, explain the functioning of a LASER that uses gaseous active medium.

(2+3+5)

3A. Mention any four applications of medical ultrasounds.

3B. What is the principle of electrosurgery? Explain monopolar and bipolar techniques used in ESU equipment.

3C. Draw the block diagram and explain working principle of a pulse echo apparatus.

(2+3+5)

4A. What do you mean by infusion pump? Compare ambulatory pump with enteral infusion pump.

4B. What are the symptoms and causes of central sleep apnea?

4C. What are the basic functions of kidneys? Explain the principle and working of a dialyzing unit that operates outside the patient's body.

(2+3+5)

5A. What are oxygenators? Compare their different types.

5B. Write a note on the focussing systems used in lithotripsy units.

5C. With the help of a neat block diagram, explain blood cell counting technique that is based on the principle of collecting scattered light from the blood cells and converting it into electrical pulses for counting.

(2+3+5)

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