

# Question Paper

Exam Date & Time: 04-Jan-2023 (02:30 PM - 05:30 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

FIFTH SEMESTER MAKE UP EXAMINATIONS DEC/ JAN ,2022/23

**BIOMEDICAL INSTRUMENTATION-II [BME 3152]**

**Marks: 50**

**Duration: 180 mins.**

**Answer all the questions.**

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) Illustrate with a neat fig, a breathing therapy unit that uses intermittent breaths to inflate the lungs. (5)
  - A)
  - B) Select and explain a flowmeter that is insensitive to gas composition and gas temperature. (3)
  - C) Compare the characteristics of different voltage waveforms used to perform the different modes in Electrosurgical unit. (2)
- 2) What are the problems caused by hyperbilirubinemia? Illustrate how the levels of bilirubin can be monitored in neonates non-invasively. (4)
  - A)
  - B) Compare B-mode and M-mode of ultrasound scan. Also, mention a few medical applications of the above mentioned modes of scanning. (4)
  - C) What happens to the power of the ultrasound beam, if the intensity of a sound beam remains unchanged, while the beam area is reduced to half? (2)
- 3) Illustrate with a neat figure, the hemodialysis machine in detail. (5)
  - A)
  - B) Determine the factors that affect the fluorescence of a material. (2)
  - C) Illustrate with a figure, how the renal calculi can be removed using ultrasonic method. (3)
- 4) Give a comparison of the natural and artificial lungs. Also, discuss the advantages and disadvantages of using autogenous lung oxygenation. (5)
  - A)
  - B) It takes 0.2 msec for the sound from ultrasound probe to travel to a baby's heel and back again. If the sound travels at 1540 m/sec inside the body, determine how far is the baby's foot below the mother's skin. (2)
  - C) Differentiate 'air mode incubator' from 'radiant warmer'. (3)
- 5) Give an example each for liquid and gaseous anesthetic agent, and mention the advantage of using inhaled anesthetic agents as compared to injected anesthetic agents. (3)
  - A)

- B) Illustrate with a neat figure, the coulter counter method used for counting blood cells. (4)
- C) Differentiate forward-view from lateral-view endoscopes and discuss the important features of fiber-optic endoscopes. (3)

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