

Exam Date & Time: 18-Jul-2022 (09:00 AM - 12:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH MAKE UP EXAMINATIONS, JULY 2022

**REHABILITATION ENGINEERING [BME 4303]**

**Marks: 50**

**Duration: 180 mins.**

**A**

**Answer all the questions.**

Instructions to Candidates:

Answer ALL questions Missing data may be suitably assumed

- 1) What are the steps to be followed for effective rehabilitation process in connection with physical disability? (2)
  - A)
  - B) What are the generally classified popular rehabilitation process? Explain in detail (3)
  - C) Explain the basic structure of a neuron and its working (5)
- 2) Stress the utility and functional significance of sodium potassium pump? (3)
  - A)
  - B) State the importance and utility of models in the development of assistive devices (3)
  - C) State the important characteristics of EMG signals (4)
- 3) What is an action potential? Explain how it occurs. (3)
  - A)
  - B) What are the different types of modeling tools? Briefly explain each of them. (3)
  - C) In detail narrate various signaling process and contribution of CNS and PNS in producing a mechanical movement of muscle cell starting from the neurons of the Brain? (4)

- 4) Define the following. A) cell membrane B) Cell fluids C) resting state of the intra cellular fluids. (3)
- A)
- B) State the important steps to be followed for developing of assistive devices (3)
- C) Formulate an algorithm for processing EMG signal for assistive device design purpose (4)
- 5) Compare the functionalities between a natural and artificial neuron (3)
- A)
- B) Describe briefly the various components of artificial neural network with proper block diagram (3)
- C) What is A) repolarization B) hyperpolarization as far as the cell structure is concerned. (4)

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