

B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.

Branch: Aerospace Engineering

Course Code: 21AE7BSBFE

Course: Biology for Engineers

Semester: VII

Duration: 3 hrs.

Max Marks: 100

Date: 19.09.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Sketch the figures wherever necessary.

UNIT - I

1. a) Elucidate the role of biology for engineers citing suitable applications. 7
- b) Present the different levels of organization of living things in the form of a schematic diagram. 6
- c) Enlist the differences between prokaryotes and eukaryotes 7

UNIT - II

2. a) What is bone remodeling? Enlist the steps of the process 6
- b) Illustrate the structure of skeletal muscle fiber. 6
- c) Elaborate on the mechanism of muscle contraction 8

OR

3. a) Elaborate on the structure of bone. 6
- b) ATP for the muscle cells is obtained from different sources. Name the sources and elucidate the mechanisms. 8
- c) Explain the process of endochondral ossification. 6

UNIT - III

4. a) Present an outline of the nervous system 7
- b) Illustrate the events of nerve impulse conduction 7
- c) Write the principle and applications of electromyogram. 6

OR

5. a) Elucidate the application of electromyogram in ergonomics. 7

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

- b) Explain the structure of neuron using a labelled diagram. **8**
- c) What is a synapse? Present the events of action potential **5**

UNIT - IV

- 6. a) Elucidate the concept of biomimicry in the design of micro air vehicles. **7**
- b) Explain how the design of Airbus is derived from the principle of biomimicry. **7**
- c) Justify the importance of exobiology in aerospace. **6**

UNIT - V

- 7. a) What is shark skin effect? Elaborate on its uses in aerospace engineering. **7**
- b) Elaborate on the bio-inspired ice phobic surfaces in aerospace engineering **6**
- c) Discuss the characteristics of plants considered for the development of self-healing composite structures. **7**
