

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
