

Basavarajeswari Group of Institutions
BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT
(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Third Semester B.E. Degree Examinations, March/April 2024

BIOLOGY FOR ENGINEERS

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<u>Module-1</u>			
1.	a. Describe animal cell structure, functions with a neat labelled diagram.	06	(2 : 1 : 1.2.1)
	b. Explain the applications of stem cells, regenerative medicine, therapeutic cloning and gene therapy.	08	(2 : 1 : 1.2.1)
	c. Explain the properties and functions of lipids biomolecules.	06	(2 : 1 : 1.2.1)
(OR)			
2.	a. Explain the classification of enzymes with one example each and properties.	08	(2 : 1 : 1.2.1)
	b. Describe prokaryotic cell structure, functions with a neat labelled diagram.	06	(2 : 1 : 1.2.1)
	c. Explain the properties and functions of proteins biomolecules.	06	(2 : 1 : 1.2.1)
<u>Module-2</u>			
3.	a. Explain the construction and properties of cellulose based water filters.	08	(2 : 2 : 1.2.1)
	b. Explain how DNA vaccines works and their importance.	06	(2 : 2 : 1.2.1)
	c. Explain why protein as food and its uses.	06	(2 : 2 : 1.2.1)
(OR)			
4.	a. Explain functions of each protein in the body with example.	08	(2 : 2 : 1.2.1)
	b. Explain the advantages and limitations of biosensors.	06	(2 : 2 : 1.2.1)
	c. Explain the roles and engineering applications of lipids.	06	(2 : 2 : 1.2.1)
<u>Module-3</u>			
5.	a. Define EEG. Discuss its applications, signals and types of brain activities.	08	(2 : 3 : 1.2.1)
	b. Explain the working and materials used in the bionic eye.	06	(2 : 3 : 1.2.1)
	c. Compare the architecture of the human brain as a CPU system.	06	(2 : 3 : 1.2.1)
(OR)			

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

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| 6. | a. Define pacemakers. Explain the construction of pacemakers and its types. | 08 | (2 :3 : 1.2.1) |
| | b. Explain the working, principle, interpretation of results of spirometry. | 06 | (2 :3 : 1.2.1) |
| | c. Discuss the 2 types of dialysis systems and their function in removing waste and excess fluids. | 06 | (2 :3 : 1.2.1) |

Module-4

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| 7. | a. Explain the working principles of ultrasonography with schematic representation and discuss its advantages. | 08 | (2 :3 : 1.2.1) |
| | b. Explain the light dependent reactions of photosynthesis with schematic representation. | 06 | (2 :3 : 1.2.1) |
| | c. Explain the advantages and limitations of haemoglobin-based oxygen carriers (HBOCs). | 06 | (2 :3 : 1.2.1) |

(OR)

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| 8. | a. State the principle and discuss the techniques used for the preparation of super hydrophobic surfaces. | 08 | (2 :3 : 1.2.1) |
| | b. Discuss the engineering applications and materials used in Velcro technology. | 06 | (2 :3 : 1.2.1) |
| | c. Explain the advantages and limitations of perfluorocarbons (PFCs). | 06 | (2 :3 : 1.2.1) |

Module-5

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| 9. | a. Explain the process and materials used in the 3D printing of skin. | 08 | (2 :4 : 1.2.1) |
| | b. Explain the advantages and limitations of artificial intelligence for disease diagnosis. | 06 | (2 :4 : 1.2.1) |
| | c. Explain the methods used for the separation or removal of heavy metals. | 06 | (2 :4 : 1.2.1) |

(OR)

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|-----------|---|-----------|----------------|
| 10 | a. Explain the technology behind electrical tongue and discuss its applications. | 08 | (2 :4 : 1.2.1) |
| | b. Discuss the most commonly used bio printing techniques (any 3). | 06 | (2 :4 : 1.2.1) |
| | c. Discuss the technological importance of DNA origami. | 06 | (2 :4 : 1.2.1) |

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