

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, January 2025

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 prokaryotic cell structure with a neat labelled diagram and its mode of reproduction.	08	(2 : 1 : 1.2.1)
	b. Explain the functions and properties of carbohydrates biomolecule.	06	(2 : 1 : 1.2.1)
	c. Explain the classification of enzymes with example for each.	06	(2 : 1 : 1.2.1)
(OR)			
2.	a. Describe Eukaryotic animal cell structure with a neat labelled diagram.	08	(2 : 1 : 1.2.1)
	b. Define stem cell, explain its unique properties and sources.	06	(2 : 1 : 1.2.1)
	c. Explain the properties and functions of hormones.	06	(2 : 1 : 1.2.1)
<u>Module-2</u>			
3.	a. Explain the process of obtaining Bio-diesel from lipids and their advantages.	08	(2 : 2 : 1.2.1)
	b. Write a note on meat analogy and examples of it.	06	(2 : 2 : 1.2.1)
	c. Explain the working of vaccines and importance of RNA vaccines.	06	(2 : 2 : 1.2.1)
(OR)			
4.	a. Explain the constructions of cellulose based water filters and its properties.	08	(2 : 2 : 1.2.1)
	b. Write a brief note on whey protein and its uses.	06	(2 : 2 : 1.2.1)
	c. What is biosensor? Explain the enzymes used in biosensors.	06	(2 : 2 : 1.2.1)
<u>Module-3</u>			
5.	a. Explain the architecture of rods and cone cells with a labelled diagram.	08	(2 : 3 : 1.2.1)
	b. Give the comparison between brain and CPU.	06	(2 : 3 : 1.2.1)
	c. Explain the working of bionic eye and the materials used in it.	06	(2 : 3 : 1.2.1)
(OR)			

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| 6. | a. What is spirometry? Explain the principle, working and interpretation of results. | 08 | (2 :3 : 1.2.1) |
| | b. Explain the reasons for blockages of blood vessels. | 06 | (2 :3 : 1.2.1) |
| | c. Compare and contrast between two main types of dialysis systems. | 06 | (2 :3 : 1.2.1) |

Module-4

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| 7. | a. Explain the techniques used to prepare super hydrophobic surfaces. | 08 | (2 :3 : 1.2.1) |
| | b. Explain the light independent reaction of photosynthesis. | 06 | (2 :3 : 1.2.1) |
| | c. Explain the advantages and disadvantages of HBOCs | 06 | (2 :3 : 1.2.1) |

(OR)

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| 8. | a. Discuss about the shark skin and friction reducing swim suits technology and its examples. | 08 | (2 :3 : 1.2.1) |
| | b. Explain the advantages and disadvantages of sonars. | 06 | (2 :3 : 1.2.1) |
| | c. Explain the materials and applications of Velcro technology. | 06 | (2 :3 : 1.2.1) |

Module-5

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| 9. | a. Explain the technology behind electric nose. | 08 | (2 :4 : 1.2.1) |
| | b. Explain the methods used for the separation or removal of metals. | 06 | (2 :4 : 1.2.1) |
| | c. Explain the advantages and disadvantages of artificial intelligence for disease diagnosis. | 06 | (2 :4 : 1.2.1) |

(OR)

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| 10 | a. Explain the 3D printing of skin and the materials used in it. | 08 | (2 :4 : 1.2.1) |
| | b. Explain about Osteoporosis and bioengineering solutions for it. | 06 | (2 :4 : 1.2.1) |
| | c. Explain the process of Muscle cells as Scaffolds. | 06 | (2 :4 : 1.2.1) |

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