

2024

BIOTECHNOLOGY

Paper : BTEC010104

(INTRODUCTION TO THE LIVING WORLD)

Full Marks : 45

Time : 2 Hours

The figures in the margin indicate full marks for the questions

1. Answer the following question in very short : $1 \times 5 = 5$
 - a) Define 'taxonomy' and its significance in biology.
 - b) What is the fundamental unit of life?
 - c) Name the term used to describe the role of an organism within its habitat.
 - d) Which microorganism is commonly used in the production of cheese?
 - e) List one example of a renewable resource.

2. Answer *any five* of following question in short : $2 \times 5 = 10$
 - a) Explain the process of osmosis with an example.
 - b) Draw the process of a plant cell and label its major organelles.
 - c) Differentiate between biotic and abiotic factors in an ecosystem.
 - d) What is ecological succession, and why is it important in ecosystems?
 - e) Summarise the steps involved in alcohol

fermentation.

- f) What are biofertilizers, and how do they contribute to sustainable agriculture?
 - g) Explain the concept of bioremediation and give an example of its application.
 - h) What is polyploidy, and how does it affect an organism's genetic makeup?
3. Write briefly on the following (*any four*): $5 \times 4 = 20$
- a) Explain the molecular basis of inheritance, focusing on Mendelian principles.
 - b) How does cell imaging contribute to our understanding of cellular organisation and function?
 - c) Discuss the energy flow in an ecosystem and its significance for nutrient cycling.
 - d) Analyse the role of antibiotics in healthcare and explain how antibiotic resistance arises.
 - e) Describe the principles of plant tissue culture and its applications in agriculture.
 - f) Describe how colloids are important in biological systems, providing relevant examples.
 - g) Explain how wind and solar energy can be harnessed for sustainable energy, highlighting advantages and challenges.
4. Answer *any one* from the following questions: $1 \times 10 = 10$
- a) Evaluate the impact of human activities on natural

ecosystems and propose strategies to mitigate these effects.

- b) Discuss the importance of animal and plant breeding in improving food and economic security, and suggest potential improvements through biotechnology.
 - c) Critically analyze the role of genetically modified organisms (GMOs) in agriculture, addressing both benefits and ethical concerns.
-