***Grade****: L3 Microbiology* ***Name:……………………...***

***Date:*** *90 minutes*

***Date:***January 19, 2025

**Scientific English Exam**

**(Answer Key and Grading Scheme)**

Biotechnology is using living organisms, cells, and biological systems to develop products and technologies that improve human life and the environment. This interdisciplinary field integrates biology, chemistry, and technology to address complex problems and create innovative solutions. The applications of biotechnology span across various sectors, including medicine, agriculture, and industry.

In medicine, biotechnology has revolutionized healthcare through advancements such as the production of vaccines, antibiotics, and gene therapies. Genetic engineering enables scientists to modify organisms to produce life-saving drugs.

In agriculture, biotechnology contributes to food security by creating genetically modified crops that can withstand pests, diseases, and extreme weather conditions. These crops often have higher yields and improved nutritional content, helping to address hunger and malnutrition. Furthermore, biotechnology enables sustainable farming practices by reducing the need for chemical pesticides and fertilizers.

Industrial biotechnology uses enzymes, microorganisms, and biocatalysts to create environmentally friendly products. Examples include the production of biofuels, biodegradable plastics, and industrial enzymes used in manufacturing processes.

Despite its potential, biotechnology also raises ethical concerns, such as genetic manipulation and its consequences, as well as unequal access to its benefits. To ensure its positive impact, regulations, and ethical frameworks must be established. As this field continues to evolve, it holds promise for addressing challenges like climate change, food scarcity, and global health issues, making it an essential tool for building a sustainable future.

**Part One: Comprehension (10 Marks)**

1. **What type of scientific text is this?**
   * Answer: An explanatory text. *(1 Mark)*
2. **Mention two applications of biotechnology in agriculture.**
   * Answer: Creating genetically modified crops to withstand pests and improving nutritional content. *(3 Marks)*
3. **Identify one example of biotechnology in medicine and one in industry:**
   * Correct Answer: **D. Both A and C** *(1 Mark)*
4. **True or False:**
   * Biotechnology is limited to the medical field. → **False** *(1.5 Mark)*
   * Industrial biotechnology reduces environmental impact by promoting sustainable practices. → **True** *(1.5Mark)*
5. **Choose the correct synonym from the text:**  
   a) Enhance → **Improve** *(1 Mark)*  
   b) Difficulties → **Challenges** *(1 Mark)*

**Section Two: Grammar (6 Marks)**

**B. Multiple-choice questions on tenses:**

1. **Scientists ……………… (study) the applications of biotechnology for decades.**
   * Correct Answer: **B. have studied** *(1 Mark)*
2. **In the 20th century, researchers ………..(discover) the process of genetic engineering.**
   * Correct Answer: **A. discovered** *(1 Mark)*
3. **By next year, new biotechnological solutions ……………… (be) available to combat climate change.**
   * Correct Answer: **C. will be** *(1 Mark)*

**Rewrite the following sentences as directed:**  
4. **Scientists are developing gene therapies to treat genetic disorders. (Rewrite in passive voice)**

* Answer: Gene therapies are being developed by scientists to treat genetic disorders.

*(1 Mark)*

1. **Biotechnology has revolutionized agriculture and medicine. (Rewrite in the past perfect tense)**
   * Answer: Biotechnology had revolutionized agriculture and medicine. *(1 Mark)*
2. **Biotechnology provides sustainable solutions; it addresses environmental challenges. (Combine using conjunction)**
   * Answer: Biotechnology provides sustainable solutions and addresses environmental challenges. *(1 Mark)*

**Section Three: Writing (4 Marks)**

*Good luck*

*Lecturer: Hadjab W*

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