

2. Breaking cellulose—hemicellulose—lignin interaction into its individual units.
3. The main organisms that have the ability to convert cellulose into glucose.
4. The types of microbes that convert cellulose into glucose.
5. The role of cellulase in the conversion of cellulose into glucose.
6. The role of hemicellulase in the conversion of hemicellulose into glucose.

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**Answer the following questions**

1. (10 Marks)

Explain the following:  
Commercial applications of FT systems.

Structure of spore: pseudo spore.

Steps of the natural generation of biofilms.

Why might soil be inhospitable to fungal biomass.

How does the rate of degradation of lignin affects the efficiency of enzyme action process.

2. (20 Marks)

Explain the following:

- a) Why might the cellulase offers several advantages over FT and hemicellulase approaches.
- b) The cellulase enzymes involved in the cellulose degradation process.
- c) The cellulase enzymes involved in the cellulose degradation process.

Question	1	2	3	4	5	6
Explain the following:	10	10	10	10	10	10
1. (10 Marks)	10	10	10	10	10	10
2. (20 Marks)	20	20	20	20	20	20
Explain the following:	10	10	10	10	10	10
a) Why might the cellulase offers several advantages over FT and hemicellulase approaches.	10	10	10	10	10	10
b) The cellulase enzymes involved in the cellulose degradation process.	10	10	10	10	10	10
c) The cellulase enzymes involved in the cellulose degradation process.	10	10	10	10	10	10

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Course: Environ. Biotechnology  
Code: (409 E)  
Date: 10/1/2024  
Time: 2 hours  
Full Mark: 70 Marks

**Answer All the following Questions**

**Question 1: (15 Marks)**

**Explain the following:**

- Application of biotechnology
- Degree of toxicity can vary
- Environmental and economic benefits contribute to development of sustainable society.

**Question 2: (20 Marks)**

**a. Complete the following.**

..... is the process in which harmful chemicals builds up inside a living organism, while, ..... is a process used to ..... by using ....., which can be use of ..... in manufacturing, microorganisms to degrade ..... or ....., monoclonal antibodies to .....

**b. Which of the following is not a reason behind air pollution?**

- 1) Industrialization
- 2) Auto exhaustion
- 3) Deforestation
- 4) Afforestation

**c. Which of the chemicals may accumulated in an organism during bio-accumulation process**

- a) Pesticides
- b) Sodium
- c) Potassium
- d) Fe

**d. What is the following process is not included in the bio accumulation**

- a) Stockpiling
- b) Elimination
- c) Filtration
- d) Uptake

**e. Which of the following method of disposal of solid waste leads to release of organic pollutants.**

- a) Incineration
- b) Phytoremediation
- c) Biological treatment
- d) Land filling

**Good Luck**

**Examiners: Prof. Maie ElGammal**