DEBRE BERHAN UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE
DEPARTMENT OF BIOLOGY

Applied Microbiology Assignments for Summer Students

Use biologydepartmentdbu@gmail.com to submit the assignment via online for all courses. The file name should begin with your name and followed by course name.

Assignment I

Part I Write true if the statement is correct or false if it is incorrect.

1. Pasteurization removes all microorganisms from milk.
2. Spores are more susceptible to heat sterilization than vegetative cells.
3. The presence of enteric bacteria in water could be used as water pollution indicators.
4. Molasses is solely a carbon source.
5. Secondary metabolites are usually produced early log phase.
6. Bacteria and fungi are prokaryotes that are industrially important.
7. Enjera is fermented food.

Part II Choose the correct or best answer from the given alternatives

8. Which of the following could be an effect of an excess of sewage running into a freshwater reservoir?
   A. It could cause the water to become polluted and nonpotable.
   B. It could cause an increase in the biological oxygen demand (BOD).
   C. It could cause oxygen depletion, leading to an increase in the anaerobic microbial population.
   D. Large quantities of organic wastes could be left behind, killing off many plants and animals or causing animals to migrate.
   E. All of the above.
9. The chemical(s) produced during sewage treatment by microorganisms include(s)_____ .

   A. CO_2
   B. NO_3^{-1}
   C. CH_4
   D. NH_3
   E. All of the above
10. Which one is **NOT** true about soil microorganisms?
    A. They provide nutrient for other organisms.
    B. They change the structure of the soil.
    C. They change the chemistry of the soil.
    D. They don't get benefit from other organisms.

E. They are very important for proper functioning of soil ecology.

11. All of the following are true about releasing untreated sewage into a river **EXCEPT**:
    A. It is a health hazard
    B. It kills bacteria
    C. It increases the BOD
    D. It decreases the dissolved oxygen
    E. None of the above
12. Which one of the following **COULDN'T** be produced by microorganisms in the industry?
    A. Ethanol
    B. Amino acids
    C. Acetic acid
    D. Penicillin
    E. None of the above
13. Root nodules contain _____, which can_____ .
    A. *Azotobacter*, fix N_2
    B. *Nitrosomonas*, nitrify NH_3
    C. Rhizobia, fix N_2
    D. *Bacillus*, denitrify NO_3
14. Antibiotics are produced in _____phase of microbial growth
    A. lag
    B. stationary
    C. decline
    D. B and C
    E. A and B
15. The process that is **NOT** needed by soil microbiologists in the soil is _____
    A. Denitrification
    B. Nitrification
    C. Ammonification
    D. Phosphate solublization
    E. Nitrogen fixation

Part III Match items in column A with the type of sewage treatment in column B (1 pt each)

Column A	**Column B**
16. Methane is produced	A. Primary treatment
17. Activated sludge is included	B. Secondary treatment
18. Is biological treatment	C. Tertiary treatment
19. Mechanical separation of solids	D. Cannot be matched
20. Involve primary sedimentation	
21. Trickle filter is part of it.	
22. Involve acetogenic bacteria	
23. Enable to reduce eutrophication	
24. Is also chemical treatment	
25. Ammonia and phosphate are removed	

Assignment II

1) Explain five methods of food preservation (not more than 2 pages).
2) Describe briefly the intrinsic four factors of microbial growth in foods.
3) As a biologist, explain the side effects of burning in the soil.
4) Explain the role of bacteria in *ayib* (Ethiopiancottage cheese) making.
5) Differentiate exotoxin from endotoxin
6) How could you dispose sludge safely?

7) W/ro Zinash Argeno is a farmer in Bench Magi Zone. She saw ETV advertising an agricultural product that safely kill soil bacteria to control bacterial diseases while she was growing soybeans (a type of legume). The agricultural specialist in the Zone claimed that soil bacteria were responsible for most crop losses. The farmer called the agricultural extension officer at Arba Minchi University for advice. Explain what the extension office crop adviser most likely told the farmer about the usefulness or harmfulness of the product.
8) Let's assume that you have enough amounts of both acacia and *chat* wood to construct wooden house on soil without cement ground. What do you select, chat or acacia wood? Why? (Hint: chat contains more lignin than acacia).