

 INDIAN SCHOOL AL WADI AL KABIR 		
Class: XII	DEPARTMENT: SCIENCE 2024-25 SUBJECT: BIOLOGY	DATE: 03-09-2024
WORKSHEET NO: 8 WITH ANSWERS	TOPIC: MICROBES IN HUMAN WELFARE	NOTE: A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

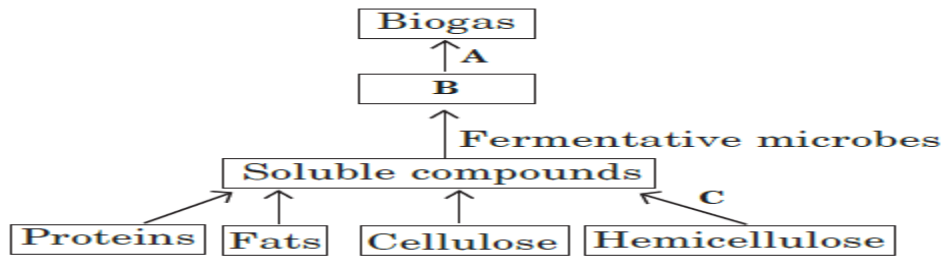
CASE STUDY

1. Alcohols are important industrial solvents. Ethanol, methanol, propanol and butanol are produced commercially by fermentation activity of some fungi, majorly yeasts. During fermentation, yeast cells convert cereal derived sugars into ethanol and CO₂. At the same time hundreds of secondary metabolites that influence the aroma and taste of alcohol are produced. Sugar concentration affects the rate of fermentation reactions. Yeast cannot grow in very strong sugar solution. In case of complex carbohydrate containing nutrient media, 1% malt or Rhizopus is used along with yeasts. Hydrolysis of starch is carried out at high temperature for 30 mins. The crushed food mixed with hot water for obtaining malt is called mash. The nutrient medium prior to fermentation is called wort. Wort is cooled down to appropriate temperature and inoculated with strain of yeast.

- a) What is brewer's yeast that is commonly used in fermentation?
- b) Name one alcoholic beverage that requires distillation and one that is consumed without distillation
- c) i. Bottled juices bought from the market are clearer than those made at home. Why?
ii. What is an inoculum?

2. Villagers in a place near Chambur started planning to make power supply for agricultural purposes from cow dung. They have started a biogas plant for the purpose. Study the flow chart for biogas production given below and answer the following questions.

- a) Biogas is composed of majorly
 - i) methane, CO₂ and O₂
 - ii) CO₂, H₂S and H₂O
 - iii) methane, CO₂ and H₂S
 - iv) H₂S, H and O₂



b) In the given flow chart, 'A' denotes

- i) aerobic bacteria
- ii) methanogenic bacteria
- iii) cellulose degrading bacteria
- iv) yeast and protozoa.

c) Briefly describe how flocs are formed.

Or

What is activated sludge and how is it formed?

MULTIPLE CHOICE QUESTIONS

1. Immunosuppressants such as _____ prevent transplanted organs from being rejected in recipients.

- a. Thrombin
- b. Cyclosporine
- c. Aspirin
- d. Statins

2. Which of these processes does not give off CO₂?

- a. Lactate fermentation
- b. Aerobic respiration
- c. Alcoholic fermentation
- d. All of these

3. High biological oxygen demand in a water body means _____

- a. Water is not polluted
- b. Water is polluted
- c. Water body contains lots of lifeforms
- d. None of the above

4. Which of the following microbes are used for the commercial production of citric acid?

- a. Xanthomonas citric
- b. Asparagine
- c. Asparagus
- d. Aspergillus

5. *Saccharomyces cerevisiae* is used primarily for
- Baking
 - Bleaching
 - Biofuel
 - None of the above
6. *Bacillus thuringiensis* is used for
- Fermentation of beer
 - Biopesticide
 - Antibiotic
 - None of the above
7. Antibiotics are the most effective on:
- Bacteria
 - Virus
 - Fungi
 - Retro viruses
8. How are the holes (spongy texture) produced in bread and cheese?
- CO₂ released by a yeast
 - CO₂ released by a bacterium.
 - CO₂ released by LAB
 - CO₂ released by methanogens.

ASSERTION REASON TYPE

(Choose any one option from the one given below for the Assertion & Reasoning type of Questions)

- Both A and Reason are true, and the R is the correct explanation of the A
 - Both A and R are true, but the R is not the correct explanation of the A
 - A is true but R is false.
 - Both A and R are false
1. Assertion: Besides curdling of milk, LAB also improve its nutritional quality by increasing vitamin-B12.
Reason: LAB, when present in human stomach, check disease causing microbes.
2. Assertion: Yeasts such as *Saccharomyces cerevisiae* are used in baking industry.
Reason: Carbon dioxide produced during fermentation causes bread dough to rise by thermal expansion.
3. Assertion: Beer and wine are called soft liquors while gin, rum, etc. are hard liquors.
Reason: Beer and wine are made without distillation.
4. Assertion: An organ transplant patient if not provided with cyclosporin A may reject the

transplanted organ.

Reason: Cyclosporin A inhibits activation of T-cells and interferes with destruction of non-self-cells.

5. Assertion: Secondary treatment of sewage is also called biological treatment while primary treatment is called physical treatment.

Reason: Primary sewage treatment depends only upon sedimentation properties of materials present in sewage and filtration.

TWO MARK QUESTIONS (Previous Board Questions)

1. Biofortification can solve the problems of —hidden hunger to a large extent. Prove it.
2. What is the key difference between primary and secondary sewage treatment?
3. What is Anaerobic Sludge digest?
4. Do you think microbes can also be used as energy convertors? If yes how?
5. What is a fermenter?
6. Give an example of a microbe that is used in statin production. How do they lower blood cholesterol level?
7. State the use of Nuclear Polyhedrosis Virus.
8. Name two microbes beneficial in biotechnology.
9. Name the common trait shared between *Clostridium butylicum*, *Lactobacillus* and *Aspergillus niger*.
10. List two industrially significant enzymes.
11. What is the significance of flocs in the biological treatment of wastewater?
12. The fungi mycorrhizal benefit the plant in which it harbors, How?
13. How are cyanobacteria used in the fields of paddy?
14. Discuss the main ideologies crucial in the biological control of diseases and pests.

THREE MARKS QUESTIONS (Previous Board Questions)

1. Single cell protein is one of the alternative source proteins for animal and human nutrition. Justify your answer.
2. The Yamuna action plan and the Ganga action plan have been initiated to reduce BOD of these rivers in and around Delhi. What is understood by this statement?
3. What is the role of the bacteria *Bacillus thuringiensis* in regulating caterpillars of insect pests?
4. a) What is the role of microbes in reducing environmental degeneration caused by chemicals?
b) Giving two examples describe biofertilizers
5. a) What is the consequence of discharging larger volumes of sewage that is untreated into a river?
b) What is the significance of anaerobic sludge digestion in sewage treatment?

FIVE MARK QUESTIONS (Previous Board Questions)

- 1.a) Why is organic farming favored these days?
b) Describe the method employed in the process.
c) Some Microbes are used in this method give examples

Hints for some questions

Assertion & Reasoning							
1-b	2-a	3-a	4-a	5-a			
Case Study							
2. a-iii b-ii c-masses of bacteria associated with fungal filaments to form mesh like structures Or Once the BOD of sewage or waste water is reduced significantly, the effluent is then passed into a settling tank where the bacterial ‘flocs’ are allowed to sediment. This sediment is called activated sludge. A small part can serve as the inoculum.							
MCQs							
1-a	2-a	3-b	4-d	5-a	6-b	7-a	8-a
Prepared by Ms Agnes Aranha				Checked by HoD Science			