SmartKalike

CBSE Class 12 · Biology

Microbes in Human Welfare

10 most probable questions for Boards 2027

Q1. 1 mark · Very short answer

Name the yeast used to ferment malted cereals and fruit juices for the production of ethanol.

Answer

Saccharomyces cerevisiae, commonly called brewer’s yeast, ferments malted cereals and fruit juices to produce ethanol.

Q2. 2 marks · Short answer

Name the microbes that convert milk into curd. Explain how their acids bring about curd formation.

Answer

Lactobacillus and other lactic acid bacteria (LAB) convert milk into curd. During growth, LAB produce acids that coagulate and partially digest milk proteins. A small amount of curd used as a starter supplies millions of LAB.

Q3. 3 marks · Medium answer

Municipal wastewater is also called sewage. State what it contains and explain why it is treated in sewage treatment plants before disposal.

Answer

1. Municipal waste-water, called sewage, contains large amounts of organic matter and microbes, many of which are pathogenic. It includes human excreta and is generated in large quantities in cities and towns.
2. Direct discharge into rivers and streams can pollute natural water bodies; therefore, sewage is treated in sewage treatment plants to make it less polluting.

Q4. 4 marks · Long answer

Explain how aeration and agitation promote the formation of microbial flocs in secondary treatment, and how the flocs reduce the effluent’s organic matter. Define BOD, state what the BOD test measures, and explain why treatment continues until BOD is significantly reduced.

Answer

Secondary treatment uses aeration and agitation to promote microbial growth and reduce organic matter in the effluent.
1. The primary effluent is constantly agitated mechanically in large aeration tanks, and air is pumped into it. These conditions allow useful aerobic microbes to grow vigorously into flocs, which are masses of bacteria associated with fungal filaments forming mesh-like structures.

2. Growing microbes in the flocs consume the major part of the organic matter in the effluent, significantly reducing its BOD.
3. BOD is the amount of oxygen that would be consumed if all the organic matter in one liter of water were oxidised by bacteria. The BOD test measures the rate of uptake of oxygen by micro-organisms in a sample of water.
4. BOD indirectly measures the organic matter present in water, and greater BOD indicates greater polluting potential. Treatment continues until BOD is significantly reduced.
Microbial flocs therefore make the effluent less polluting before further treatment.

Q5. 5 marks · Long answer

Define antibiotics. Describe how Fleming discovered penicillin by chance and explain how it received its name.

Answer

Antibiotics are chemical substances produced by some microbes that can kill or retard the growth of other disease-causing microbes.
1. Alexander Fleming, while working on Staphylococci bacteria, once observed a mould growing in one of his unwashed culture plates.
2. Staphylococci could not grow around the mould, and Fleming found that a chemical produced by the mould caused this inhibition.
3. Fleming named the chemical Penicillin after the mould Penicillium notatum.
4. The observation was a chance discovery, and Penicillin was the first antibiotic to be discovered; its full potential as an effective antibiotic was established later by Ernest Chain and Howard Florey.
Antibiotics are regarded as one of the most significant discoveries of the twentieth century and have greatly improved the treatment of deadly diseases.

Q6. 1 mark · Very short answer

Name one alcoholic drink produced without distillation and one produced by distilling fermented broth.

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Q7. 2 marks · Short answer

What causes dosa and idli dough to puff up during fermentation?

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Q8. 3 marks · Medium answer

State where methanogens are found in cattle and in sewage treatment, and describe their role in the cattle rumen. Explain why cattle dung can generate biogas and describe the tank and floating cover of a biogas plant.

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Q9. 5 marks · Long answer

Explain Chain and Florey’s contribution to establishing penicillin’s effectiveness. State its use during World War II and the significance of the 1945 Nobel Prize. Name diseases whose treatment has been improved by antibiotics.

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Q10. 1 mark · Multiple choice

Microbes are used commercially and industrially to produce which group of products?
(A) Organic acids, alcohols and enzymes
(B) Vitamins, antibodies and vaccines only
(C) Antibiotics, antibodies and hormones only
(D) Starch, cellulose and nucleic acids only

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