2 MARKS EACH

1. Microorganisms cannot be seen with naked eye. How is it possible to study them?
2. How is curd produced? What is the role of LAB?
3. Identify the industrial setup shown in the figure. Name one industry that uses this setup.

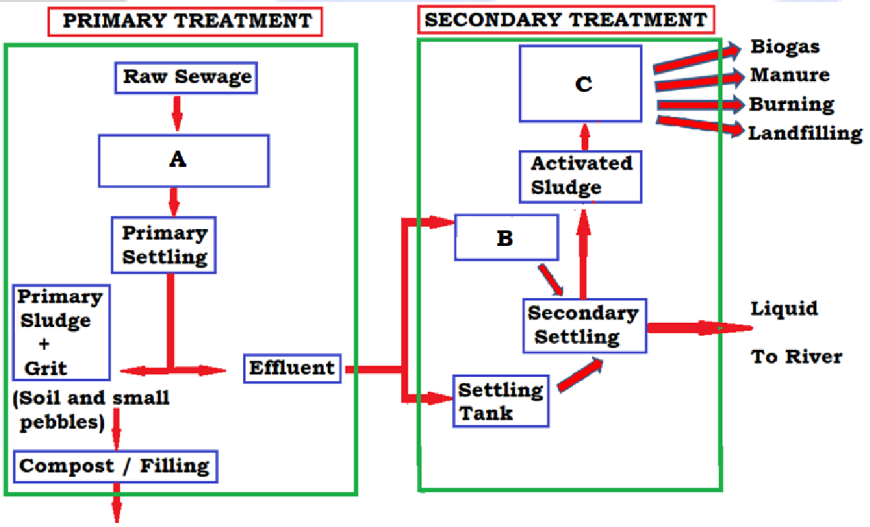
4. Microorganism, yeast *Saccharomyces cerevisiae*, is very important in two industries. Name them.
5. Identify the equipment shown in the figure. Where are these used?

6. How is alcohol produced on a large scale?
7. Classify alcoholic drinks depending on the type of processing.
8. Full potential of penicillin as an effective antibiotic was established much later and it was extensively used to treat American soldiers wounded in World War II. Name the scientists who established this role of penicillin and received Nobel Prize along with Fleming.
9. Name four antibiotics other than penicillin and their sources?
10. Name four deadly diseases that can now be effectively treated by antibiotics.
11. Name the organisms used for production of organic acids – citric, acetic, butyric and lactic.
12. Name a blood cholesterol inhibiting agent. How does it act?
13. Define bioactive molecule. Give one example.
14. Differentiate between Primary sludge and Secondary or anaerobic sludge.

15. How is biogas generated in a sewage treatment plant?
16. How can Bacterium – Bacillus thuringiensis be used as an effective biocontrol agent against butterfly caterpillars?
17. Name one biofertiliser that can be effectively used in paddy fields. State one additional benefit of the same.
18. Name any two species of fungi, which are used in the production of the antibiotics.
19. Bacteria cannot be seen with the naked eyes, but these can be seen with the help of a microscope. If you have to carry a sample from your home to your biology laboratory to demonstrate the presence of microbes under a microscope, which sample would you carry and why?
20. Arrange the following in the decreasing order (most important first) of their importance, for the welfare of human society. Give reasons for your answer. Biogas, Citric acid, Penicillin and Curd

3 MARKS EACH

1. Curd is better than milk. Justify with three reasons.
2. Define BOD. What does it measure? How does it help in assessing pollution?
3. Differentiate between Primary and Secondary treatments in Sewage Treatment Plant.
4. What is biogas? How is it produced?
5. (a) Where are methanogens found?
   (b) Why is dung water added to biogas plant?
   (c) Why is biogas plant also called gobar gas plant?
6. How can the following be used as biocontrol agents?
   Ladybird, Dragon flies, fungus - *Trichoderma*.
7. Why are baculoviruses effective biocontrol agents? State two conditions when they are desirable.
8. Explain the advantages of symbiotic relationship between fungus Glomus and roots of higher plants.
9. In the diagrammatic representation of a sewage treatment plant,



(a) identify the steps 'A' that raw sewage undergoes in primary treatment,

(b) identify 'B'. What happens here?

(c) identify 'C'. What happens here?

3 MARKS EACH

1. (a) The puffed-up appearance of dough used for making foods such as dosa and idli is due to the production of CO_2 gas. Name the metabolic pathway which is taking place resulting in the formation of CO_2?

   (b) Name the organism that is responsible. Where does it come from?

   (c) Name the organism used in making bread.

   (d) State the products of fermentation.

2. How are 'Swiss cheese' and 'Roquefort cheese' produced?

3. (a) Define antibiotics.

   (b) Name the first antibiotic to be discovered. How was it discovered?

4. Large quantities of sewage is generated every day in cities and towns. Define sewage. Why is it important to remove it from water before discharging it into rivers?

5. Name two initiatives taken by the government to save major rivers of our country from pollution. State the main aim of these initiatives.

6. Three water samples, namely, river water, untreated sewage water and secondary effluent discharged from a sewage treatment plant were subjected to BOD test. The samples were labelled A, B and C, but the laboratory attendant did not note which was which. The BOD values of three samples A, B and C were recorded as 20 mg/L, 8 mg/L and 400 mg/L respectively. Which sample of the water is most polluted? Can you assign the correct label to each, assuming the river water is relatively clean?

7. Why are biogas plants more often build in rural areas? Name the agencies that developed the technology of biogas production.

8 (a) Microbes produce different types of gaseous end-products during growth and metabolism. Justify with examples.

   (b) Name two gases produced by microbes that have commercial applications?

9. Name 'A', 'B' and 'C' in the following reactions.

   (a) Sugary juice $\xrightarrow{A}$ Ethanol + CO_2

   (b) Ethanol $\longrightarrow$ B

   (c) Lactose $\xrightarrow{LAB}$ C + CO_2

5 MARKS EACH

1. Give reasons for the following:

   (a) Detergent formulations claim to effectively remove oily stains.

   (b) Bottled fruit juices bought from the market are clearer as compared to those made at home.

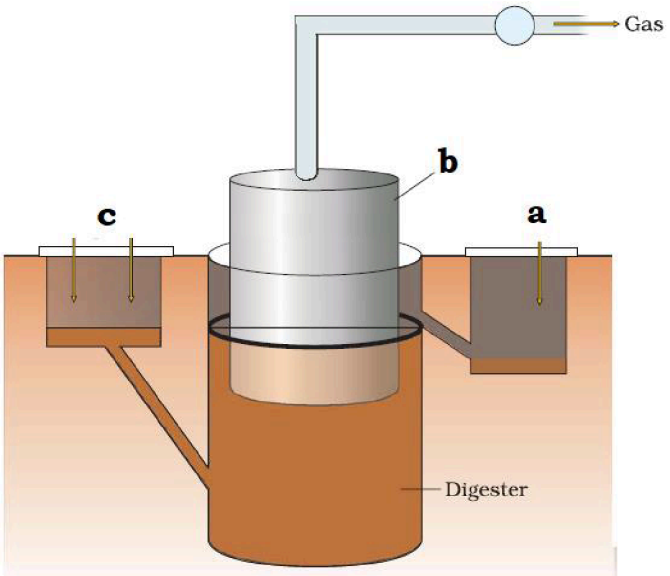
(c) Microorganisms can help patients who have undergone myocardial infraction leading to heart attack.

(d) Microorganisms can help patients who have undergone organ-transplant.

(e) Microorganisms can help people with high cholesterol levels.

2. Explain the basic steps of a sewage treatment plant.

3. In the figure depicting a typical biogas plant, identify 'a', 'b' and 'c'.



Describe the sequence of events occuring in a biogas plant.

4. Why is chemical control of pests not advisable in agriculture? What is biocontrol? Where is it used?

5. The use of the chemical fertilisers to meet the ever-increasing demand of agricultural produce has contributed significantly to environmental pollution. There are problems associated with the overuse of chemical fertilisers and there is a large pressure to switch to organic farming – to use of bio-fertilisers. What are bio-fertilisers? State broad categories with examples.