NCERT TEXTUAL EXERCISE (SOLVED)

1. 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?

Ans. Soil sample/water sample as they are the natural habitat of microorganism and can be directly observed.

2. Give examples to prove that microbes release gases during metabolism.

Ans. (i) Production of acetic acid (ii) Production of biogas

3. In which food would you find lactic acid bacteria? Mention some of their useful applications.

Ans. Milk, Curd, Cheese – Coagulated product.

4. Name some traditional Indian foods made of wheat, rice and Bengal gram (or their products) which involve use of microbes.

Ans. Idli, Dhokla, Dosa.

5. In which way have microbes played a major role in controlling diseases caused by harmful bacteria?

Ans. By production of antibiotics like penicillin, tetracyclin, by production of vaccines for herpes, TB, DPT, etc.

6. Name any two species of fungus, which are used in the production of the antibiotics.

Ans. *Pencillium chrysogenum, P. notatum.*

7. What is sewage? In which way can sewage be harmful to us?

Ans. Sewage is wasterwater release from household and industrial applications. It is harmful as

(i) Decreased flora and fauna of H_2O

(ii) Contamination of H_2O/food/soil

(iii) Dissemination of pathogenic bacteria

8. What is the key difference between primary and secondary sewage treatment?

Ans. 1° treatment – for removal of particulate as settelable particle

2° treatment – for decreased BOD by microbial oxidation.

9. Do you think microbes can also be used as source of energy? If yes, how?

Ans. By release of inflammable biogas in biogas plant

Use of microbial culture for SCP (single cell protein).

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10. Microbes can be used to decrease the use of chemical fertilisers and pesticides. Explain how this can be accomplished.

Ans. By use of biofertilisers – Use of leguminous plant with *Rhizobium*
Use of sulphur fixing bacteria
Use of hydrogen fixing bacteria.

11. 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 the 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?

Ans. The sample with BOD value of 400 mg/h is most polluted and should be levelled as B → untreated sewage river H_2O will be → less BOD → 8 mg/L – sample A.

Untreated water > 2° effluent BOD > River water

400 > 20 > 8 and so should be labelled as sample C.

12. Find out the name of the microbes from which Cyclosporin A (an immunosuppressive drug) and Statins (blood cholesterol lowering agents) are obtained.

Ans. Cyclosporin A – *Trichoderma polysporum*

Statin – *Monascus purpureus*.

13. Find out the role of microbes in the following and discuss it with your teacher.

(a) Single cell protein (SCP) (b) Soil

Ans. **SCP – single cell protein** is, microbial yield/cell crop of bacterial, yeast, algae rich in protein. The protein content of microbial cell is very high. Dried cell of *Pseudemonas* grown on petroleum product has 69% protein and these proteins have all essential amino acid.

Soil : enrichment and *replacement as* symbiotic and mycrorhizal associations.

14. 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.

Ans. **Biogas:** Most important for community welfare as

(i) It reduces excreta, waste from community

(ii) Produces inflamamble gases, can be used as energy source

(iii) renewable source

(iv) Multi-dimensional utility

(v) Easily maintained and dissipated for community purpose.

Penicillin: Medicinal use of microbes, good for health of society, commercially more usable.

Citric acid: Industrial use, not for dissipation in community.

Curd: Low important for society – as it depends on individual use – has only nutritions value.

15. How do biofertilisers enrich the fertility of the soil?

Ans. (i) By replenishment of lost nutrients like N_2, Phosphorus, Iron and Sulphur

(ii) By addition of required micro-nutrients and macro-nutrients

(iii) By making humus, compost

(iv) By acting as scavanger.