BIOLOGY

BOOKS - PRADEEP BIOLOGY (HINGLISH)

MICROBES IN HUMAN WELFARE

Curiosity Questions

1. What kind of fermentation is considered as the oldest biotechnological process?

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2. Name any five industrial products of yeast fermentation

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3. Can we include the antibiotic-like substances extracted from green plants or from other non-microbial sources in the category of antibiotics.

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4. Why Danish people used to prepare cheese by using the stomach of sheep and goat.

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5. What are disadvantages of untreated sewage?

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Notable Question

1. It is believed that earthworms play very important role in the development and maintenance of soil fertility. Is it not possible to employ earthworms in a large scale in improve the fertility of soil?

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Ncert Exercises With Answers

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?

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

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

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

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

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

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

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

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

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10. Three water samples namely river water, untreated sewage water and secondary effluent discharge 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

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

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

(a) Single cell protein (SCP)

(b) Soil

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13. 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

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

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Additional Questions Very Short Answer Questions

1. which of the following is included in biopesticide ?

A. Viruses and bacteria

B. visruses, bacteria and fungi

C. Viruses, bacteria, fungi,protozoa and mites

D. Viruses, bacteria, fungi and protozoa.

Answer: C

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Additional Questions Very Short Answer Questions

1. Which of the following can be controlled by using biopesticides ?

A. Insects

B. Diseases

C. Weeds

D. All of them

Answer: A::D

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2. Biofertilisers include

A. Blue-green algae, rhizobia, other nitrogen fixing bacteria and mycorrhiza fungi

B. Blue-green algae, rhizobia and other fixing bacteria

C. Rhizobia , other nitrogen fixing bacteria and mycorrhiza fungi

D. Blue green algae, rhizobia and mycorrhiza fungi.

Answer: A

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3. Define biofertillisers.

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4. Define biopesticides.

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5. Name the first organic acid produced by microbial fermentation.

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6. Name the two vitamins produced by microbial fermentation.

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7. Which symbiotic nitrogen-fixing cyanobacterium lives in association with Azolla.

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8. Expand LAB.

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9. Name the kind of cheese which possess characteristic holes.

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10. Expand BOD.

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11. Which bacterium contains insecticidal crystal protein-thruioside and kills a wide range of insects.

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12. Name the classes of organisms that produce antibiotics.

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13. What are antibiotics?

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14. Name three enzymes of industrial importance.

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15. Name any five industrial products of yeast fermentation

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16. Name the two types of fermentation processes.

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17. List any two liquid household products obtained through microbial activity.

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18. What is the botanical name of baker's yeast?

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19. Name any two important kinds of cheese.

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20. Name the sources of biofertillizers.

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21. Name the group of organisms and the substrate they act on to produce biogas.

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22. Which of the following is a free living bacteria that ca fix nitrogen in the soil.

Spirulina, Azospirillum, Sonalika

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23. Which one of the following is the baker's yeast used in fermentation?

Saccharum barberi, saccharomyces cerevisiae, Sonalika

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24. Milk starts to coagulate when Lactic Acid Bactria (LAB) is added to warm milk as a starter. Mention any other two benefits LAB provides.

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25. Which of the following is a cyanobacterium that can fix atmospheric nitrogen?

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26. Mention the information that the health workers derive by measuring BOD of a water body.

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27. Given an example of a rod-shaped virus.

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28. Name any genetically modified crop.

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29. Which species of Penicillium produces Roquefort cheese?

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30. What is the group of bacteria found in both the rumen of cattle and sludge of sewage treatment?

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31. How has the discovery of antibiotics helped mankind in the field of medicine?

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32. Name a microbe used for statin production. How do statins lower blood cholesterol level?

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33. In fermentation of dough which is the main gas produced?

A. Carbon dioxide

B. Hydrogen

C. Both a and b

D. Methane

Answer: A

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34. Saccharomyces cerevisiae is used for production of

A. Bread

B. Ethanol

C. Both a and b

D. Acetic acid

Answer: A

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35. Which of the following is not concerned with biotechnology?

A. Biogas production

B. Sewage treatment

C. Biofertiliizers

D. Wood seasoning

Answer: D

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36. Nostoc is used as biopesticide/biofertilliser. (Choose correct one)

A. Tobacco budworm

B. Armyworm

C. Beetle

D. Mosquito

Answer: D

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37. Name a genus of baculovirus. Why are they considered good biocontrol agents ?

A. Nucleopolyhedro-virus (NPV). The host eats the polyhedra or granules which get dissolved in the basic digestive gut juices. Infected insects become dead and get dissolved on leaf surface releasing more viruses.

B.

C.

D.

Answer:

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38. Give the scientific name of the source organism from which the first antibiotic was produced.

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Additional Questions Short Answer Questions

1. What are the processes through which soil nutrients are lost and what process restores them. What is the justification of using artificicla methods of maintaining soil fertility.

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2. Name any two undistilled alcoholic beverages and two distilled alcoholic beverages.

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3. What is the chemical composition of sewage?

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4. What are the harmful effects of untreated sewage?

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5. What kinds of microorganisms are employed in the treatment of sewage? Give their activities.

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6. What is the composition of biogas?

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7. What are the different uses of biogas?

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8. A farmer adds Azotobacter culture to the soil before sowing maize. How does it increase the yield of maize?

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9. Name any two cyanobacteria and explain how they serve as main sources of biofertilisers.

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10. Name the blank spaces a, b, c and d in the table given below

Type of Microbe	Name Product	Commercial
Fungus	a	Penicillin
Bacterium	Acetobacter aceti	b
c	Aspergillus niger	citric acid
Yeast	d	ethanol

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11. During the secondary treatment of the primary effluent how does the significant decrease in BOD occurs?

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12. How does addition of a small amount of curd to fresh milk help formation of curd ? Mention a nutritional quality that gets added to the curd ?

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13. Define biofertillisers. Give examples of any two free-living nitrogen fixing microorganisms.

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14. What is the chemical nature of biogas. Name an organism which is involved in biogas production?

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15. What are biofertilisers? Give two examples.

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16. Why are cyanobacteria considered useful in paddy fields ?

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17. Name an enzyme produced by Streptococcus and describes its role in medical science.

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18. From which microbe the streptokinase is produced and what is its role?

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19. What is mycorrhiza? Explain with an example.

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20. Write the scientific names of microbes which are used in production of citric acid and butyric acid.

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21. Legumes fertillize the soil but cereal do not. Discuss.

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22. What organic farming ?

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23. Name two microbes used as biopesticides.

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24. Name the bacterium responsible for the large holes seen in "Swiss Cheese" . What are these holes due to?

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25. Mention a product of human welfare obtained with the help of each one of the following microbes :

(a) LAB

(b) Sacchromyces cerevisiae

(c) Propionibacterium shermanii

(d) Aspergillus niger

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26. Explain the function of "anaerobic sludge digester" in a sewage treatment plant.

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27. How does the applications of cyanobacteria help improve agriculture output?

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28. How do mycorrhizae help the plants to grow better?

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29. "Large scale cultivation of spirullina is highly advantageous for human population. "Explain giving two reasons.

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30. Name the microbes that help production of the following products commercially.

(a) Statins (b) Citric acid (c) Penicillin (d) Butyric acid

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31. Write the binomials of two fungi and mention the products/bioactive molecuels they help to produce.

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32. Give the binomials of two types of yeast and the commercial bioactive products they help to produce

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33. Your advice is sought to improve the nitrogen content of the soil to be used for cultivation of a non-leguminous terrestrial crop.

(a) Recommend two microbes that can enrich the soil with altrogen.

(b)Why do leguminous crops not require such enrichment of the soil?

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34. What are the advantages of using biofertillizers in Agriculture?

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35. Write explanatory mole on cyanobacterial biofertillizers.

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36. What are the constituent gases in biogas? Which gas is highly inflammable?

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37. What are the advantages of biogas plant in rural.

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38. What are the harmful effects of sewage? Write what you know about BOD.

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39. What are the properties of antibiotic?

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40. Write short notes on: (a) Role of microbes in preparation of curd (b) Swiss cheese.

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41. Explain how the following microbes act as biocontrol agents:

(a) Bacillus thuringiensis (b) Nucleopolyhedrovirus

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42. Explain the role of baculviruses as biological control agents. Mention their importance in orgenic farming.

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43. (a) How does activated sludge get produced during sewage treatment?

(b) Explain how this sludge is used in biogas production.

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44. Identify a,b,c,d, e and f in the table give below:

S. No.	Organism	Bioactive molecule	Use
1.	*Monascus purpureus*	(*a*)	(*b*)
2.	(*c*)	(*d*)	antibiotic
3.	(*e*)	cyclosporin A	(*f*)

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45. Mention the product and its use produced by each of the microbes listed below:

(i) Streptococcus. (ii) Lactobacillus. (iii) Saccharomyces Cerevisiae.

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46. A. Name two important macronutrients which are made available for plants by biofertillizers.

B. Name the cyanobacterium which forms symbiotic association with Azolla.

C. Give the names of the partners which form symbiotic association in the following: (i) Lichen (ii) Mycorrhiza (iii) Root nodules (iv) Coralloid roots.

D. Give the name of bacterium which was used as first biopesticide on a commercial scale in the world.

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47. Match the items in column (A) with column (B). Each point in column (A) has minimum one match in column (B) and maximum three matches.

Column (A)	Column (B)
1. Mycorrhiza	(*a*) Rotenones
2. *Bacillus thuringiensis*	(*b*) Leguminous plants
3. Root nodules	(*c*) Insecticide
4. Biopesticide	(*d*) Phosphorus nutrition
5. Fern	(*e*) Cry protein
	(*f*) *Rhizobium*
	(*g*) Azadirachtin
	(*h*) *Azolla*
	(*i*) Leghaemoglobin

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48. Make correction wherever you find mistake in spellings/words in the following paragraph/sentences.

A. Biofertilisers are a high-cost output but they do not pollute the environment. Acceptability of biofertillisers is also low because they usually produce quick and spectacular results.

B. Fungi of mycorrhiza solubilise phosphorus, produce plant growth inhibiting substance and protect host plants from soil nutrients.

(C) Biopesticides are those chemical agents that are used for control of weeds. insects and pathogons.

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49. Discuss about the major programs that the Ministry of Environment and Forests, Govt. of India has initiated for saving major India rivers from pollution.

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50. Name the genus to which baculoviruses belong. Describe their role in the integrated pest management programmes.

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51. Mention the roels of microbes in industrial products.

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52. Describes how biogas is generated from activated sludge. List the components of biogas.

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53. Choose any three microbes from the following which are suited for organic farming which is in great demand these days. Mention one

application of each one chosen: Mycorrhiza, Monascus, Anabaer, Rhizobium, Methanobacterium, Trichoderma

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54. State the medicinal value and the bioactive molecules produced by Streptococcus. Monascus and Trichoderma.

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55. What are methanogens ? How do they help to generate biogas ?

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56. (a) How do organic farmers control pests ? Give two example.

(b) State the difference in their approach from that of conventional pest control methods.

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57. Describe how do 'flocs' and 'activated sludge' help in Sevage Treatment.

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58. (a) Organic farmers prefer biological control of diseases and pests to the use of chemicals for the purpose justify

(b) Give example of a bacterium a fungus and an insect that are used as bio-control agents

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59. The three microbes are listed below. Name the product produced by each one of them and mention their use.

(a) Aspergillus niger

(b) Trichoderma polysporum

(c) Monascus purpureus

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

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61. Baculoviruses are good example of bio-control agents. Justify giving three reasons.

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Additional Questions Long Answer Questions

1. Explain the methods of controlling insect pests.

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2. Discuss the role of microbes in production of household products.

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3. Give the role of microbes in the production of alcoholic beverages.

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4. Define antiobiotics. List some important properties of antibiotics.

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5. Give an acccount of sewage treatment.

Watch Video Solution

6. Discuss the role of microbes in production of blogas.

Watch Video Solution

7. Describe the role of symbiotic nitrogen fixing bacteria in the improvement of soil fertillity.

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8. Fill in the blanks:

A. Chemical _____ and _____ are the sources of widespread pollution.

B. Spores of Bacillus _____ Bacillus _____ Produce insecticidal_____Protein.

C. Biofertilisers promote plant growth and protect plants from soil _____

D. Mycorrhizae help in solubilisation of _____ which is present in soil in the insoluble forms

E. Rhizobia form root _____ in _____ crops and some_____ form symbiotic association with the fern Azolla.

F. Different varieties of cheese are known by their characteristic_____

G. Single cell protein (SCP) provides a valuable ____ rich supplement in

_____ diet.

H. The sewage water is treated till the BOD is found to be____

I. The bacteria responsible for production of biogas are collectively called _____

J. _____ grwo in milk and convert it to curd.

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9. Draw a diagrammatic sketch of biogas plant and label its various components given below. Gas holder, sludge chamber, Digester, Dung+water chamber. Also briefly explain the utility of this biogas plant.

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10. Describe the main ideas behind biological control of pests and diseases. Also give same good examples of biopesticides.

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11. Describe the role of microbes in household products.

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12. How can the microbes be used as biocontrol agents? Explain.

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13. What is the role of microbes in antibiotics? Explain.

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14. Explain biofertillisers and the role of symbiotic nitrogen fixing cyanobacteria in enriching soil fertility.

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Anaylytical Questions With Answers

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

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2. Name a microbe used for statin production. How do statins lower blood cholesterol level?

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3. What is BOD? What does it mean if a water sample has more BOD?

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4. What is the function of aeration tank in the treatment of sewage?

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5. Name the water ferm that is an excellent biofertilliser for rice cultigvation. What helps the fern to do so?

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6. What are mycorrhiza? Give their importance in crop production.

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7. How does the applications of the fungal genus, Glomus, to the agricultural farm increase the farm output?

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8. Why should biological control of pests and pathogens be preferred to the conventional use of chemical pesticides?

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9. Name 'A' and 'B' in the following equaiton.

Surger juice $\xrightarrow{'A'}$ Ethanol $+ H_2O$: Ethanol $\xrightarrow{\text{Acetobacter aceti}}$ $'B'$

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10. What is the role of microbes in sewage treatment plant?

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11. What will be happen if you add a small amount of curd to the fresh milk and keep it for few hours at $25^\circ C$. Name the process, chemical changes and the resultant products. Name any three edible products prepared from it.

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12. Name the gobar gas liberated from blogs plant. Which type of bacteria are responsible for its production? What are the advantages of using it as a source of energy?

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13. As we are going to face a great crists of fossil fuel in near future, suggest an ecofriendly and pollution free alternative source of energy for rural areas which is dependent on microbial activity.

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14. Explain why some microorganisms are called biofertilizers. Give two examples.

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15. Recommend the specific biofertillizer for the following: Give reason for you recommendations.

(i) Paddy field (ii) Wheat crop (iii) Crop crop.

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16. Identify the microorganism i A soil inhabiting bacteria that forms symbiotic association with the roots of leguminous plants. Ii A cyanobacteria that forms symbiotic association with an aquatic fern. Iii A methaneogenic bacteria used in the production of biogas.

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17. (a) Why are the fruit juices brought from market clearer as compared to those made at home?

(b) Name the bioactive molecule produced by Trichoderma polysporum.

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18. What is obtained from cultures of streptococcus bacterium? What is the use of this product? Give its alternative name also.

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19. List the most common microorganisms which are termed lactic acid bacteria (LAB). Write their three functions.

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20. What are Brewer's yeast? Which microorganisms are used in the production of beer and wine and how?

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Practice Questions Multiple Choice Questions

1. Bacillus thuringiensis (Bt) strains have been used for designing novel

A. Biogertilizers

B. Bio-metallurgical techniques

C. Bio-mineralization processes

D. Bio-insecticidal plants.

Answer: D

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2. In which one of the following the BOD (Biochemical Oxygen Demand) of sewage (S), distillery effluent (DE), paper mill effluent (PE) and sugar mill effluent (SE) have been arranged in ascending order ?

A. $Se < Pe < S < DE$

B. $S < DE < PE < SE$

C. $SE < S < Pt < DE$

D.

Answer: B

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3. Probiotics are

A. Cancer inducing microbes

B. New kind of food allergens

C. Live microbial food supplement

D. Safe antiobiotics

Answer: C

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4. Lactic acid is formed by the process of

A. Fermentation

B. Glycolysis

C. HMP Pathway

D. None of these.

Answer: A

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5. A good example of organic fertillizer which improves phosphorus uptake is

A. Actinomcetes fungi

B. Rhizobium

C. Azospirillum

D. None of these.

Answer: C

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6. What happens when we inoculate Rhizobium in wheat field?

A. No increase in production (nitrogen content of soil remains same)

B. A lot of increase in production (nitrogen content of soil increases)

C. Fertility of soil decreases

D. Fertility of soil increases.

Answer: A

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7. Which of the following antibiotic is active against fungus

A. Strephomycin

B. Polyenes

C. Tetracycline

D. Neomycin.

Answer: B

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8. Which is maitained for optimum production of vinegar

A. Anaerobic condition

B. Temperature of $65^{\circ} C$

C. Aerobic condition

D. Microaerophilic condition

Answer: A

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9. Which of the following is widely used as a successful biofertiliser in Indian rice fields ?

A. Rhizobium

B. Acacia arabica

C. Acalypha indica

D. Azolla pinnata

Answer: D

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10. Nitrogen fixation in root nodules of Alnus is brought about by

A. Frankia

B. Azorhizobium

C. Bradyrhizobium

D. Clostridium.

Answer: A

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11. Trichoderma harizianum has proved to be a useful microorganism for

A. Gene trasnfer in higher plants.

B. Biological control of soil -borne plant pathogens

C. Bioremediation of contaminated soils

D. Reclamation of wastelands.

Answer: B

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12. Which one of the following bacterium is used extensively as biopesticide?

A. Bacillus subtils

B. Bacillus thuringiensis

C. Streptococcus lactis

D. Lactobacillus acidophilas.

Answer: B

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13. Cyclosporin - an immunosuppressive drug - is produced by

A. Aspergillus niger

B. Manascus purpureus

C. Penicillium notatum

D. Trichoderma polysporum

Answer: D

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14. Methanogens, growing anaerobically on cellulosic material produce

A. Methane

B. Methane and carbon dioxide

C. Methane and hydrogen

D. Methane,carbon dioxide and hydrogen

Answer: D

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15. Biochemical oxygen demand (BOD) in a river water

A. has no relationship with concentration of oxygen in the water

B. gives a measure of Salmonella in the water

C. Increase when sewage gets with river water

D. remains unchanged when algal bloom occurs.

Answer: C

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16. Which of the following is not used as a biopesticide ?

A. Trichoderma harzianum

B. Nuclear polyhderodsis virus (NPV)

C. Xanthomanas compestris

D. Bacillus thuringiensis

Answer: C

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17. Sewage treatment process in which part of decomposer bacteria is recycled into starting of the process is called :

A. Cyclic treatment

B. Activated sludge treatment

C. Primary treatment

D. Tertiary treatment.

Answer: B

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18. What would happen if oxygen availability to activated sludge flocs is reduced ?

A. It will slow down the rate of degradation of organic matter

B. The centre of flocs will become anoxic, which would cause death.

C. Flocs would increase in size as anaerobic bacteria would grow around flocs

D. Protozoa would grow in large numbers.

Answer: B

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19. Mycorrhiza does not help the host plant in

A. Enhancing its phosphorus uptake capacity

B. Increasing its tolerance to drought

C. Enhancing its resistance to root pathogens

D. Increasing its resistance to insects.

Answer: D

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20. Which one of the following is not a nitrogen-fixing organism ?

A. Anabaena

B. Nostoc

C. Azotobacter

D. Pseudomonas

Answer: D

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21. Big holes in Swiss cheese are made by a

A. a machine

B. a bacterium that produces methane gas

C. a bacterium producing a large amount of carbon dioxide.

D. a fungus that releases a lot of gases during its metabolic activities.

Answer: C

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22. The residue left after methane production from cattle dung is

A. burnt

B. burried in land fills

C. used as manure

D. used in civil construction.

Answer: C

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23. Methanogens do not produce

A. oxygen

B. Methane and carbon dioxide

C. hydrogen sulfide

D. carbon dioxide

Answer: A

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24. Activated sludge should have the ability to settle quickly so that it can

A. be rapidly pumped back from sedimentation to aeration tank

B. absorb pathogenic bacteria present in waste water while sinking to the bottom of the settling tank

C. be discarded and anaerobically digested

D. absorb colloidal organic matter.

Answer: A

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25. Which one is the most important role of microorganism of the well being of humans?

A. sewage treatment

B. production of methane

C. producion of SO_2

D. conversion of milk to curd

Answer: A

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26. Match the items in column 'A' and column 'B' and choose correct answer.

Column 'A'	Column 'B'
(i) Lady bird	(a) Methanobacterium
(ii) Mycorrhiza	(b) Trichoderma
(iii) Biological control	(c) Aphids
(iv) Bio-gas	(d) Glomus

The correct answer is:

A. i-b,ii-d,iii-c,iv-d

B. i-c,ii-d,iii-b,iv-a

C. i-d,ii-a,iii-b,iv-c

D. i-c,ii-b,iii-a,iv-d

Answer: B

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27. Select the correct statement from the following

A. Activated sludge sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria.

B. Biogas is produced by the activity of aerobic bacteria on animal wastes.

C. Methanobacterium is an aerobic bacterium found in rumen of cattle.

D. Biogas, commonly gobar gas is pure methane.

Answer: A

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28. Which one of the following is not used in organic farming ?

A. Small

B. Glomus

C. Earthworm

D. Oscillatoria

Answer: A

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29. A common biocontrol agent for the control of plant diseases is

A. Trichoderma harzianum

B. Baculovirus

C. Bacillus thuringiensis

D. Glomus

Answer: A

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30. The common nitrogen-fixer in paddy fields is

A. Frankia

B. Rhizobium

C. Azospirillum

D. Oscillatoria

Answer: C

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31. An example of endomycorrhiza is

A. Nostoc

B. Glomus

C. Agaricus

D. Rhizobium

Answer: B

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32. Leguminous plants are able to fix atmospheric nitrogen through the process of symbiotic nitrogen fixation. Which one of the following statements is not correct for this process of nitrogen fixation ?

A. Leghaemoglobin scavenges oxygen and is pinkish in colour.

B. Nodules act as sites of nitrogen fixation.

C. The enzyme nitrogenase catalyses the conversion of atmospheric N_2 to NH_3.

D. Nitrogenase is insensitive to oxygen.

Answer: D

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33. Select the correct combination of the statements (a-d) regarding the characteristics of certain organisms

A. Methanogens are archaebacteria which produce methane in marshy areas.

B. Nostoc is a filamentous blue green alga which fixes atmospheric nitrogen.

C. Chemosynthetic autotrophic bacteria synthesise cellulose from glucose.

D. Mycoplasma lacks a cell wall

Answer: D

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34. when domestic sewage mixes with water ,

A. Small animals like rats will die after drinking river water.

B. The increased microbial activity releases micronutrients such as iron.

C. The increased microbial activity uses up dissolved oxyen.

D. The river water is still suitable for drinking as impurities are only about 0.1%.

Answer: C

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35. Bacteriphages kill

A. fungi

B. parasites

C. bacteria

D. viruses

Answer: C

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36. which one of the following is used as biological insecticide ?

A. Tiger beetle

B. Caterpillar

C. Silk moth

D. Mazra Poka

Answer: A

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37. The purpose of bioligical treatment of waste water is to

A. reduce BOD

B. increase BOD

C. reduce sedimentation

D. increase sedimentation.

Answer: A

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38. The main source of biofertillizers are

A. Bacteria

B. cyanobacteria

C. fungi

D. all of these

Answer: D

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39. The product of which of the following organsims has been commercialised as blood cholesterol lowering agent:

A. Trichoderma polysporum

B. Saccharomyces cerevisiae

C. Aspergillus niger

D. Monaascus purpurea

Answer: D

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40. Nitrogen is absorbed by plants in form of

A. NO_3^-

B. NH_3

C. NO_2^-

D. both a and c

Answer: D

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41. Biogas production is carried out by

A. thermoacidophils

B. methanogens

C. halophiles

D. luminants.

Answer: B

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42. Biogas produced by the fermentation of manure , sewage , cattle dung , etc., predominantly comprises

A. methane, nitrogen and hydrogen

B. methane and carbon dioxide

C. methane and carbon monoxide

D. methane and nitric oxide.

Answer: B

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43. Trichoderma species are potentially useful as

A. biopesticides

B. biofertillizers

C. methanogens

D. vectors for genetic engineering.

Answer: A

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44. Which of the following is used as a bioweapon ?

A. Bacillus anthracis

B. Botulinum toxin

C. Bacillus thuringiensis

D. Small pox

Answer: C

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45. Rotenone is a

A. bioherbicide

B. commonly used biofertilizer

C. bioinsecticide

D. juvenile hormone.

Answer: C

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46. Bacillus thuringiensis is used to control

A. bacterial pathogens

B. fungal pathogens

C. nematodes

D. insect pests

Answer: D

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47. Which one of these microbes is used in the commercial production of ethanol?

A. Clostridium butylicum

B. Streptococcus

C. Trichoderma polysporum

D. Saccharomyces cerevisiae.

Answer: D

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48. An organism used as a biofertilizer for raising soyabean crop is:-

A. Azotobacter

B. Zospirillum

C. Rhizobium

D. Nostoc

Answer: C

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49. Ethanol is commercially produced through a particular species of:-

A. Saccharomyces

B. Clostridium

C. Trichoderma polysporum

D. Aspergillus

Answer: A

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50. Which one of the following helps in the absorption of phosphorus from soil by plants?

A. Glomus

B. Rhizobium

C. Frankia

D. Anabaena

Answer: A

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51. Continous addition of sugars in 'fed batch' fermentation is done to

A. produce methane

B. obtain antibiotics

C. purify enzymes

D. degrade sewage.

Answer: B

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52. Bacillus thuringiensis forms protein crystals which contain insecticidal protein. This protein:

A. binds with epithelial cells of midgut of the insect pest ultimately killing it

B. is cooled by several genes including the gene cry

C. is activated by acid pH of the foregut of the insect pest.

D. does not kill the carrier bacterium which is it-self resistant to this toxin.

Answer: A

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53. Read the following statement having two blanks (A) and (B):"A drug used for (A) patients is obtained from a species of the organism (B)."

The correct option for the two blanks is:

A. heart , Penicilium

B. organ-transplant, Trichoderma

C. swine flu, Monascus

D. AIDS , Pseudomonas

Answer: B

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54. Which one of the following is a wrong matching of a microbe and its industrial product, while the remaining three are correct:-

A. yeast-statins

B. Acetobacter aceti-acetic acid

C. Clostridium butylicum-lactic acid

D. Aspergillus niger-citric acid

Answer: C

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55. Monascus purpureus is a yeast ued commercially in the production of

A. ethanol

B. steptokinase for removing clots from the blood vessels

C. citric acid

D. blood cholesterol lowering statins.

Answer: D

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56. Which one of the following is an example of carrying out biological control of pests/diseases using microbes

A. Trichoderma sp. Against certain plant pathogens.

B. Nucleopolyhedrovirus against white rust in Brassica

C. Bt-cotton to increase cotton yield

D. Lady bird beetle against aphids in mustard

Answer: A

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57. Yeast is used in the production of

A. Citric acid and lactic acid

B. Lipase and pecinase

C. Bread and beer

D. Cheese and butter.

Answer: C

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58. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are the ones categorised as

A. Cyanobacteria

B. Archaebacteria

C. Chemosynthetic autotrophs

D. Heterotrophic bacteria.

Answer: D

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59. Which one single organism or the pair of organisms is correctly assigned to its or their named taxonomic group?

A. Paramecium and Plasmodium belong to the same kingdom as that of Penicillium

B. Lichen is a composite organism formed from the symbiotic association of an algae and a protozoan

C. yeast used in making bread and beer is a fungus

D. Nostoc and Anobaena are examples of protista

Answer: C

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60. To speed up the malting process in brewing industry the growth hormone used is

A. auxin

B. gibberellic acid

C. kinetin

D. ethylene

Answer: B

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61. Lactic acid bacteria (LAB) grow in milk and convert it to curd and also improve its nutritional quality by increasing

A. vitamin A

B. vitamin B_{12}

C. vitamin B_6

D. vitamin C and A

Answer: B

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62. During sewage treatment, biogases are produced which includes :

A. methane,oxygen,hydrogen,sulphide

B. hydrogen,sulphide, methane, sulphur dioxide

C. hydrogen,sulphide,nitrogen,methane

D. methane,hydrogen sulphide, carbon dioxide.

Answer: D

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63. A good producer of citric acid is :

A. Pseudomonas

B. Clostridium

C. Saccharomyces

D. Aspergillus.

Answer: D

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64. Which one as used/regarded as biofertilliser?

A. A association between pteridophytes and cyanobacteria Anabaena

B. A association between gymnosperms and Nostoc

C. A association between legume and Rhizobium

D. All of the above.

Answer: D

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65. Which one of the following is not used in the production of yoghurt

A. S. thermophilus

B. Lactobacillus bulgaricus

C. Acetobactor aceti

D. Streptococcus lactis

Answer: C

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66. Match the following list of microbes and their importance

(A)	*Saccharomyces cerevisiae*	(i)	Production of immunosuppressive agents
(B)	*Monascus purpureus*	(ii)	Ripening of swiss cheese
(C)	*Trichoderma polysporum*	(iii)	Commerical production of ethanol
(C)	*Propionibacterium sharmanii*	(iv)	Production of blood cholesterol lowering agents

A. iii,i,iv,ii

B. iii,iv,i,ii

C. iv,iii,ii,i

D. iv,ii,i,iii

Answer: B

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67. The introduction of t-DNA into plants involves

A. Allowing the plant roots to stand in water

B. Infection of the plant by Agrobacterium tumefaciens

C. Altering the pH of the soil, then heat shocking the plants

D. Exposing the plants to cold for a brief period.

Answer: B

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68. The taq polymerase enzyme is obtained from

A. Thiobacillus ferroxidans

B. Bacillus subtilis

C. Pseudomonas putida

D. Thermus aquaticus

Answer: D

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69. Match Column Iwith Column II and select the correct option using the codes given below:

Column-I	Column-II
(a) Citric acid	(i) Trichoderma
(b) Cyclosporin A	(ii) Clostridium
(c) Statins	(iii) Aspergillus
(d) Butyric acid	(iv) Monascus

A. iii,i,ii,iv

B. iii,i,iv,ii

C. i,iv,ii,iii

D. iii,iv,i,ii

Answer: C

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70. Which of the following is wrongly matched in the given table ?

A.

Microbe	Product	Application
Monascus purpureus	Statins	Lowering of blood cholesterol

B.

Microbe	Product	Application
Streptococcus	Streptokinase	Removal of clot from blood vessel

C.

Microbe	Product	Application
Clostridium butylicum	Lipase	Removal of oil stains

D.

Microbe	Product	Application
Trichoderma polysporum	Cyclosporin A	Immunosuppressive drug

Answer: B

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71. Which of the following is correctly matched for the product produced by them

A. Methanobacterium: Lactic acid

B. Penicillium:Acetic acid

C. Saccharomyces cerevisiae: Ethanol

D. Acetobacter aceti: Antibiotics

Answer: C

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72. Conversion of milk to curd improves its nutritional value of increasing the amount of

A. vitamin D

B. vitamin A

C. vitamin B_{12}

D. vitamin E

Answer: C

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73. Select the correct match.

A. Ribozyme -Nucleic acid

B. $F_2 \times$ Recessive parent-Dihybrid cross

C. T.H. Morgan - Transduction

D. G. Mendel -Transformation.

Answer: A

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Practice Questions Assertion Reason Type Questions

1. Assertion. Bread and other such haked products are porous and soft.

Reason. Both CO_2 and alcohol escape during baking.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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2. Assertion : Biofertilisers are preferred to chemical fertilisers.

Reason : Chemical fertilisers are generally more expensive and hazardous to environment.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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3. Assertion. The antibiotics produced by Streptomyces species have found greatest commercial application.

Reason: Some of the important life saving antibiotics such as penicillia and polymixia-B are produced by streptomyces.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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4. Assertion: Industrial fermentations are money making ventrues.

Reason They require a through research to discover high yields of produce at least possible expenses.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: B

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5. Assertion : the disadvantages of chemical pesticides can be overcome by the use of biopesticides.

Reasomn: Biopesticides are the harmless pesticides of biological orgin which are used to cotrol weeds and pests without causing any significant damage .

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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6. Assertion. Chemical pesticides are more hazardous as compared to biopesticides.

Reason. Chemical pesticides are mostly non-specific, expensive, hazardous and pollute the atmosphere.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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7. Assertion: Yeasts should not be used in brewing and baking industries. Reason. They produce several harmpul products during brewing and baking.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: D

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8. Assertion. The technologies developed in the laboratories have to be gradually scaled up to industrial levels.

Reason. To obtain the product in large scale.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: A

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9. Assertion. Most of the orchids are dependent on fungi in seeding stage.

Reason. The fungual mycelium penetrates the cortical cells of orchid roots.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: B

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10. Assertion. Azolla pinnata is used as a biofertilizer in rice cultivation. Reason. Azolla performs dinitrogen fixation with the help of symbotic bacterium Bacillus sp.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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11. Assertion : Leguminous plants are best preferred for rotation of crops. Reason : They have root nodules which possess nitrogen fixing bacterium Clostridium

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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12. Assertion : Aflatoxins are produced by Aspergillus flavus.

Reason : These toxins are useful to mankind.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion.

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

C. If Assertion is true but the Reason is false.

D. If both Assertion and Reason are false.

Answer: C

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