



BIOLOGY

BOOKS - MTG IIT JEE FOUNDATION

MICROORGANISMS : FRIEND AND FOE

Illustrations

1. Define microorganisms.



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2. Where are microorganisms found?



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3. Name the groups in which microorganisms can be divided.



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4. Describe various types of bacteria on the basis of cell shape with examples.



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5. State any four beneficial effects of bacteria.



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6. Mention important uses of fungi.



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7. Name some diseases caused by protozoa.



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8. Which two common diseases do viruses cause?



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9. Name any two algae.



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10. Describe the main characteristics of viruses in brief.



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11. Name two common preservatives.



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12. What are pathogens?



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13. What are communicable diseases?



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14. How do microorganisms spoil food?



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15. What is atmospheric nitrogen fixation?



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16. Compare nitrification and denitrification.



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1. What are vaccines ?



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2. Fungal infection does not occur in jams and pickles. Why?



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3. Name some food items that are prepared by using yeast.



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4. What is the economic importance of bacteria in medicine?



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5. How do microbes survive in adverse environmental conditions?



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6. Where do mosquitoes breed?



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7. What are the basic features of Protozoa?



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8. Name certain diseases which can be prevented by vaccination.



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9. What are antibiotics?



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10. Who converts the various compounds of nitrogen present in dead animals and plants back into nitrites and nitrates ?



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11. What do you mean by pasteurisation of milk?
How it differs from homogenisation?



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12. Give two examples from daily life about the beneficial effects of microorganisms.



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Ncert Section Fill In The Blanks

1. Fill in the blanks:

Microorganisms can be seen with the help of a
_____.



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2. Fill in the blanks:

Blue green algae fix _____ directly from air to enhance fertility of soil.



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3. Fill in the blanks:

Alcohol is produced with the help of _____.



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4. Cholera is caused by _____.



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Ncert Section Tick The Correct Answer

1. Yeast is used in the production of

A. sugar

B. alcohol

C. hydrochloric acid

D. oxygen.

Answer:



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2. Tick the correct answer:

The following is an antibiotic

A. Sodium bicarbonate

B. Dtreptomycin

C. Alcohol

D. Yeast

Answer:



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3. Tick the correct answer:

Carrier of malaria-causing protozoan is

A. female Anopheles mosquito

B. cockroach

C. housefly

D. butterfly

Answer:



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4. Tick the correct answer:

The most common carrier of communicable diseases is

A. ant

B. housefly

C. dragonfly

D. spider.

Answer:



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5. Tick the correct answer:

The bread or idli dough rises because of

A. heat

B. grinding

C. growth of yeast cells

D. kneading.

Answer:



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6. Tick the correct answer:

The process of conversion of sugar into alcohol is called

A. nitrogen fixation

B. moulding

C. fermentation

D. infection.

Answer:



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1. Match the organisms in Column A with their action in Column B.

Column A

(i) Bacteria

(ii) Rhizobium

(iii) Lactobacillus

(iv) Yeast

(v) A protozoan

(vi) A virus

Column B

(a) Fixing nitrogen

(b) Setting of curd

(c) Baking of bread

(d) Causing malaria

(e) Causing cholera

(f) Causing AIDS

(g) Producing antibodies



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2. Can microorganisms be seen with the naked eye? If not, how can they be seen?



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3. What are the major groups of microorganisms?



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4. Name the microorganisms which can fix atmospheric nitrogen in the soil.



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5. Write 10 lines on the usefulness of microorganisms in our lives.



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6. Write a short paragraph on the harms caused by microorganisms.



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7. What are antibiotics? What precautions must be taken while taking antibiotics?



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Exercise Multiple Choice Questions Level 1

1. Penicillin is obtained from a/an

A. alga

B. protozoan

C. virus

D. fungus.

Answer: D



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2. Bacterium responsible for the curdling of milk is

A. Lactobacillus

B. E. coli

C. Rhizobium

D. Plasmodium.

Answer: A



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3. Aedes and Anopheles are

A. bacteria

B. protozoans

C. algae

D. none of these.

Answer: D



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4. Amoeba is a/an

A. virus

B. alga

C. protozoan

D. bacterium

Answer: C



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5. Cocci are _____ shaped bacteria.

A. rod

B. round

C. spiral

D. comma

Answer: B



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6. Mushrooms are

A. algae

B. bacteria

C. fungi

D. none of these

Answer: C



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7. Which of the following is the smallest microorganism?

A. Alga

B. Bacterium

C. Protozoan

D. Virus

Answer: D



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8. Bacteria are _____organisms.

A. single-celled

B. multicellular

C. non-cellular

D. none of these

Answer: A



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9. Algae are autotrophs because they

A. carry out anaerobic respiration

B. can manufacture their own food

C. feed on dead organisms

D. feed on other living organisms.

Answer: B



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10. Orange mould grows on

A. butter

B. bread

C. chapattis

D. oranges.

Answer: B



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11. Microorganisms which cause diseases are called

- A. antigens
- B. antibodies
- C. pathogens
- D. vectors.

Answer: C



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12. Which of the following act as a host for the virus which causes dengue fever?

A. Mosquitoes

B. Houseflies

C. Rats

D. Humans

Answer: A



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13. Ringworm can be prevented by

- A. vaccination
- B. vector control
- C. improving personal hygiene
- D. using antibiotics.

Answer: C



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14. Tuberculosis spreads by

A. mosquitoes

B. houseflies

C. contaminated water

D. droplets of sneeze and cough.

Answer: D



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15. Which of the following bacteria can live symbiotically?

A. Rhizobium

B. Nitrosomonas

C. Azotobacter

D. Clostridium

Answer: A



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16. Cholera is caused by

A. Streptococcus

B. Clostridium

C. Pasteurella

D. Vibrio.

Answer: D



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17. Fungi can be distinguished by

- A. absence of chlorophyll
- B. presence of chitin in cell wall
- C. presence of plastids
- D. both (a) and (b).

Answer: D



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18. Which one of the following produces antibiotics?

A. Mucor

B. Rhizopus

C. Penicillium

D. Agaricus

Answer: C



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19. Study of fungi is known as

A. phycology

B. mycology

C. ecology

D. none of these.

Answer: B



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20. Pasteurisation is a method invented by

A. Edward Jenner

B. Alexander Fleming

C. Louis Pasteur

D. Robert Koch.

Answer: C



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21. Algae differ from fungi in being

A. heterotrophic

B. autotrophic

C. parasitic

D. sporophytic.

Answer: B



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22. The transmission and infection of *Entamoeba histolytica* is through

- A. mosquito bite
- B. bird droppings
- C. contaminated food and water
- D. sweat.

Answer: C



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23. Bacterial virus is called

- A. cyanophage
- B. bacteriophage
- C. mycophage
- D. proteophage.

Answer: B



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24. Common cold is a

- A. bacterial disease
- B. viral disease
- C. protozoan disease
- D. algal disease.

Answer: B



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25. The vector of malaria in humans is

A. Culex

B. Aedes

C. Anopheles

D. all of these.

Answer: C



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26. Which of the following involves the use of microorganisms?

A. Production of chemical fertilisers

B. Production of fireworks

C. Production of antibiotics

D. None of these

Answer: C



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27. What is caused by the harmful effects of certain microorganisms?

A. Fermentation of glucose

B. Food poisoning in humans

C. Heart disease in humans

D. Production of antibiotics

Answer: B



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28. Malaria is caused by a

A. virus

B. fungus

C. protozoan

D. bacterium

Answer: C



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29. The branch of biology which deals with the study of microorganisms is called

A. botany

B. zoology

C. microbiology

D. genetics.

Answer: C



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30. These organisms have an ability to help in recycling of nutrients. Which organisms are these?

A. Bacteria

B. Diatoms

C. Viruses

D. Algae

Answer: A



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Exercise Multiple Choice Questions Level 2

1. Which statement about pathogens is true?

- A. All pathogens are non-parasitic.
- B. All microorganisms are pathogens.
- C. All pathogens are harmful to humans.
- D. All pathogens are beneficial to humans.

Answer: C



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2. Mushroom grows on

- A. sandy soil
- B. wet soil
- C. dry soil
- D. all of these.

Answer: B



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3. Bacterium present in root nodules of pea is

A. Lactobacillus

B. E. coli

C. Rhizobium

D. Plasmodium.

Answer: C



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4. Which of the following statements describe a bacteriophage correctly?

A. It is a bacterium which causes diseases in plants.

B. It is a type of virus which attacks bacteria.

C. It is a bacterium which kills viruses.

D. It can multiply inside both living and non living cells.

Answer: B



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5. At $37^{\circ}C$ and in damp conditions, bacteria reproduce easily through

- A. budding
- B. binary fission
- C. conjugation
- D. spore formation.

Answer: B



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6. Which of the following characteristics is/are true for a virus?

I. It has a nucleus.

II. It reproduces only in living cells.

III. It contains either DNA or RNA.

A. I only

B. I and III

C. II and III

D. I, II and III

Answer: C





7. When fungal spores land on a piece of bread left on a table then after a few days, the bread becomes mouldy. What conditions favour the growth of the fungus?

- I. The presence of food
- II. The moist temperature
- III. The absence of water

A. I only

B. I and II

C. II and III

D. I, II and III

Answer: B



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8. Which of the following microorganisms play important roles in maintaining the balance of nitrogen gas in the atmosphere?

A. Viruses

B. Bacteria

C. Algae

D. Protozoa

Answer: B



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9. Which process takes place when yeast is added to grape juice and left for a week?

A. Decomposition

B. Fermentation

C. Distillation

D. Oxidation

Answer: B



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10. Microorganisms are used in biotechnology or genetic engineering for

- I. the production of bioplastic
- II. the production of hormones
- III. gene therapy

A. II only

B. II and III

C. I and III

D. I, II and III

Answer: D



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11. Trypanosoma brucei causes

A. infection

B. amoebic dysentery

C. sleeping sickness

D. none of these.

Answer: C



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12. Mosquitoes are vectors for

I. Dengue fever

II. Malaria

III. Cholera

A. I only

B. I and II

C. II and III

D. I, II and III

Answer: B



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13. 'It is caused by a protozoan. It causes fever and can cause anaemia'.

The above information describes the disease named

A. cholera

B. malaria

C. filariasis

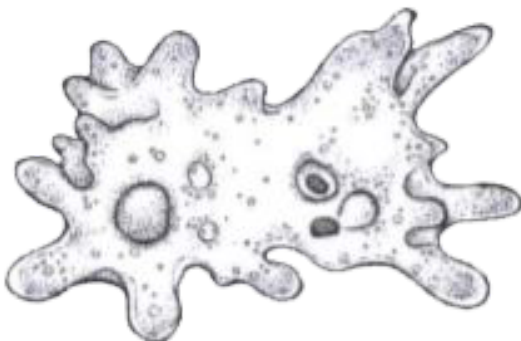
D. hepatitis

Answer: B



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14. Which of the following statement is incorrect for the given figure?



- A. It is single celled and possesses nucleus.
- B. It has parasitic nutrition.
- C. It reproduces asexually by binary fission.
- D. It lacks cell wall and is pleomorphic.

Answer: B



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15. Red/Pink bread mould is the common name for

A. *Batrachospermum*

B. Rhizopus

C. Agaricus

D. Fusarium.

Answer: B



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16. Spraying of oil on stagnant water controls malaria because the

A. oil kills malarial parasites in mosquitoes

B. water becomes too dirty for mosquitoes

C. mosquito larvae cannot breathe

D. none of these.

Answer: C



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17. Viruses are made of

A. lipoprotein

B. glycosides

C. nucleoprotein

D. lipids.

Answer: C



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18. The most important character which suggests that viruses are living is that

- A. viruses multiply only in living host
- B. their crystals have a definite shape
- C. viruses grow in size
- D. viruses may be crystallised.

Answer: A



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19. Which of the following is matched correctly in the table given below?

	Disease	Transmission
I.	AIDS	Through sexual intercourse
II.	Malaria	Through body contact
III.	Hepatitis A and B	Through contaminated food

A. I only

B. I and II

C. I and III

D. II and III

Answer: A



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20. Which of the following is a correctly matched pair of useful microorganisms and their

activities?

Microorganism	Activity
<i>I.</i> Yeast	Ferments glucose to produce alcohol
<i>II.</i> Bacteria	Decompose dead materials
<i>III.</i> Nitrogen-fixing bacteria	Convert nitrogen into protein in plants

A. I only

B. I and II

C. II and III

D. I, II and III

Answer: B



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Exercise Assertion Reason Type

1. Assertion : Fungi are heterotrophic.

Reason : They lack chlorophyll.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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2. Assertion : The parasitic fungi cause a number of diseases in plants.

Reason : Fungi are involved in nutrient cycling.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B



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3. Assertion Budding occurs in yeast .

Reason It is similar to fission process of bacteria .

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.

Answer: B



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4. Assertion : Penicillium yields penicillin.

Reason : Penicillium causes soft rot disease of citrus fruits.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: B



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5. Assertion : Viruses that infect bacteria are called bacteriophages.

Reason : Bacteriophages are devoid of capsid.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: C



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6. Assertion : Atmospheric nitrogen is always fixed by nitrogen-fixing micro organisms.

Reason : They convert ammonia present in atmosphere to nitrites and nitrates.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D



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7. Assertion : Bacterial cell walls are not like the plant cell.

Reason : Bacterial cell wall is not made up of cellulose.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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8. Assertion : Cooling stops microbes from growing.

Reason : A refrigerator keeps food at about $5^{\circ}C$.

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.

Answer: B



9. Assertion : Bacteria are useful in leather industry and jute industry.

Reason : Bacteria separate jute fibres and perform leather tanning.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A



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10. Assertion : Bacteria and fungi are used to make medicines.

Reason : These medicines are used to cure viral diseases.

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.
- D. If both assertion and reason are false.

Answer: C



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Exercise Subjective Questions Very Short Answer Type

1. Name two serious diseases caused by viruses.



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2. Name two diseases caused by protozoans.



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3. Name any three protozoans.





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4. Name any two fungi.



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5. Which groups of microbes consist of only unicellular organisms?



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6. Name the groups in which multicellular microbes are present.



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7. Which bacteria is responsible for the curdling of milk?



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8. Name a bacterium which is used to produce alcohol.



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9. What do you mean by fermentation?



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10. Who discovered the process of fermentation?



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11. Name any two free-living bacteria.



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12. Who discovered the first antibiotic?



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13. Name any two symbiotic bacteria.



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14. Give one important use of algae.



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15. Define denitrification.



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Exercise Subjective Questions Short Answer Type

1. Where can you locate the microorganisms?



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2. What are the major groups of microorganisms?



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3. Describe the role of blue green algae in soil fertility.



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4. Write the harmful effects of bacteria.



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5. Write the harmful effects of fungi and algae.



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6. What is the importance of nitrogen fixing bacteria in agriculture?



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7. Suggest some methods to prevent the growth of moulds.



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8. Name the type of microorganisms which cause the following diseases :

Sleeping sickness



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9. Name the type of microorganisms which cause the following diseases :

Plague



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10. Name the type of microorganisms which cause the following diseases :

Common cold



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11. Name the type of microorganisms which cause the following diseases :

Malaria



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12. Name the type of microorganisms which cause the following diseases :

Anthrax.



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13. How does microorganisms enter into our body?



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14. What are viruses? Draw a labelled diagram of a virus.



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Exercise Subjective Questions Long Answer Type

1. Write a short note on bacteria.



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2. What are fungi? How are they useful or harmful to us? Give figures also.



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3. What do you mean by food poisoning? Explain.



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4. What are food preservatives? Write about some common preservatives.



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5. Nitrogen Cycle



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Olympiad Hots Corner

1. Consider the following statements and select the option which correctly identifies true (T) and false (F) ones.

(i) Diatoms float in water due to the presence of light storage fats with silica.

(ii) AIDS virus kills WBC and reduces immunity of the body.

(iii) Escherichia coli is present in intestine of human where they help in digestion of food.

(iv) A virus always consists of double strands of DNA or RNA surrounded by protein coat.

A. (i) (ii) (iii) (iv)
T F T F

B. (i) (ii) (iii) (iv)
T T T F

C. (i) (ii) (iii) (iv)
T T F F

D. (i) (ii) (iii) (iv)
T F T T

Answer: B



2. Select the incorrect statement.

A. Anthrax is a bacterial disease that affects humans and cattle.

B. Rust of wheat is a fungal disease that spread by air.

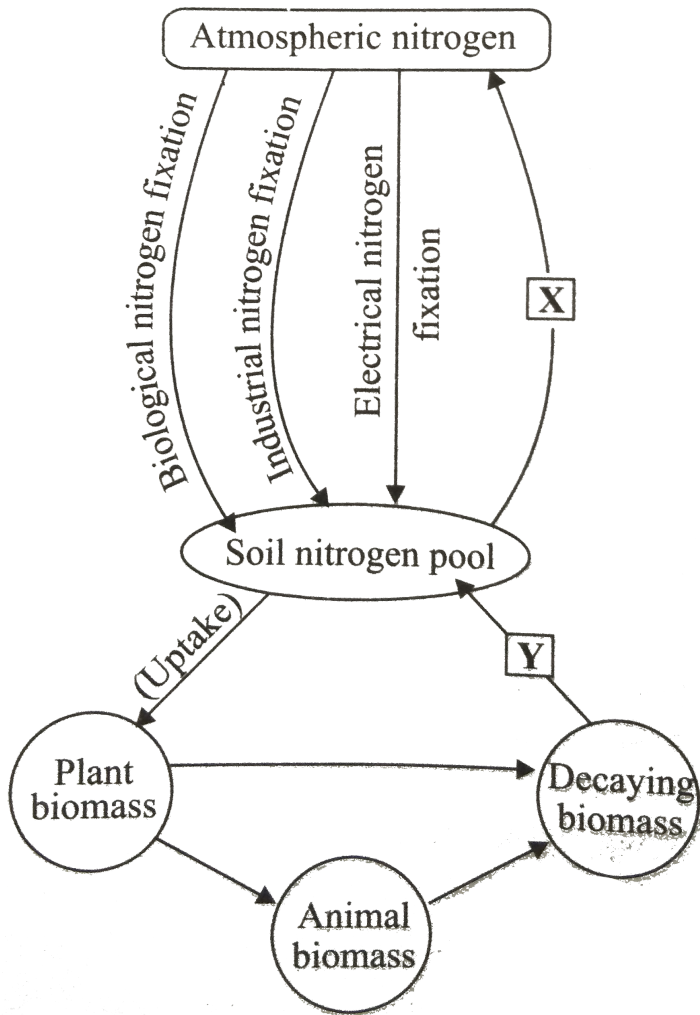
C. Citrus canker is a viral disease that affects citrus fruits.

D. Yellow vein mosaic is a viral disease that affects bhindi.

Answer: C



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3.

Identify the labels X and Y in the given outline of N_2 cycle and select the correct option.

A. In the process X, protein is converted into ammonia by the action of bacteria while in the process Y nitrates present in the decaying remains get converted into free nitrogen gas.

B. In the process X, nitrates present in the soil get converted into free nitrogen gas while in the process Y, protein is converted into ammonia by the action of bacteria.

C. Process X represents the conversion of ammonia into nitrates while process Y

represents the conversion of nitrates into the free nitrogen gas.

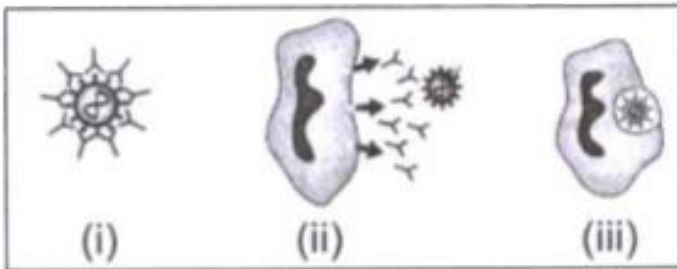
D. Process X represents the conversion of ammonia into nitrites while process Y represents the conversion of complex organic compound like proteins into ammonia.

Answer: B



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4. Refer to the given figure showing different steps regarding antibodies fighting against a disease.



Arrange them in a correct sequence.

A. $(ii) \rightarrow (i) \rightarrow (iii)$

B. $(i) \rightarrow (ii) \rightarrow (iii)$

C. $(i) \rightarrow (iii) \rightarrow (ii)$

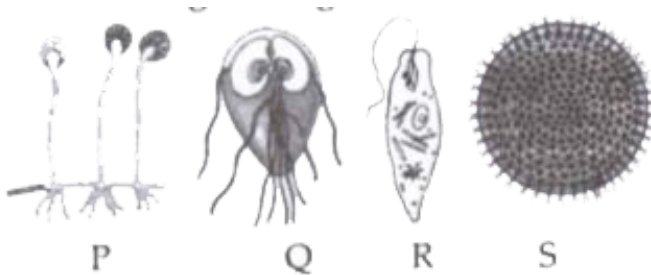
D. $(iii) \rightarrow (i) \rightarrow (ii)$

Answer: A



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5. Refer to the given figures P, Q, R and S.



Which of the following statements are correct regarding them?

P is the mould from which penicillin is made.

(ii) R is considered as connecting link between plants and animals.

(iii) Q and S are parasites which live in the bodies of other organisms including human beings.

(iv) R and S bear chlorophyll and prepare food in the presence of sunlight.

(v) S is colonial form of algae.

A. (ii), (iv) and (v) only

B. (i), (ii), (iv) and (v) only

C. (i), (iii) and (iv) only

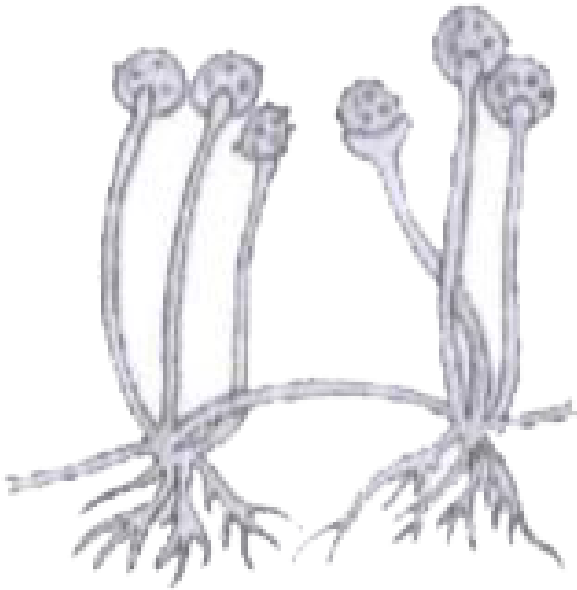
D. (i), (ii), (iii), (iv) and (v)

Answer: A



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6. Identify the given microorganism and select the incorrect statement regarding it.



A. It is a saprophyte commonly called as black bread mould.

B. It reproduces by means of spores.

C. It results in the spoilage of food materials.

D. It is a parasitic fungus that causes various diseases in plants, animals and humans.

Answer: D



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7. Refer to the given dichotomous key. Identify P - T and select the incorrect statement.

I. (a) It is unicellular organism. - Go to II

(b) It is multicellular organism. Go to IV

II. (a) It possesses well organised nucleus. Go to III

(b) It lacks well organised nucleus. -P

III. (a) Nutrition is parasitic. -Q

(b) Nutrition is mixotrophic. -R

IV. (a) It possesses chlorophyll. - S

(b) It lacks chlorophyll. -T

A. P can convert lactose sugar of milk into
lactic acid.

B. R could be Euglena which possesses cilia
that helps in movement.

C. Q could be Plasmodium which causes malaria or it could be Entamoeba which causes amoebic dysentery in humans.

D. S could be a plant like pondweed whereas T could be a scavenger like vulture or a decomposer like Rhizopus.

Answer: B



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8. Match column I with column II and select the correct option from the given codes.

Column I	Column II
P. Anopheles	(i) A fungus from which antibiotic is obtained
Q. Rhizobium	(ii) A viral disease
R. Penicillium	(iii) A bacterium responsible for curdling of milk
S. Hepatitis B	(iv) Nitrogen fixing bacterium
T. Lactobacillus	(v) Edible fungus
U. Mushroom	(vi) Vector for malarial parasite

A. P-(vi), Q-(iv), R-(i), S-(ii), T-(iii), U-(v)

B. P-(ii), Q-(v), R-(iii), S-(i), T-(vi), U-(iv)

C. P-(iv), Q-(vi), R-(i), S-(v), T-(ii), U-(iii)

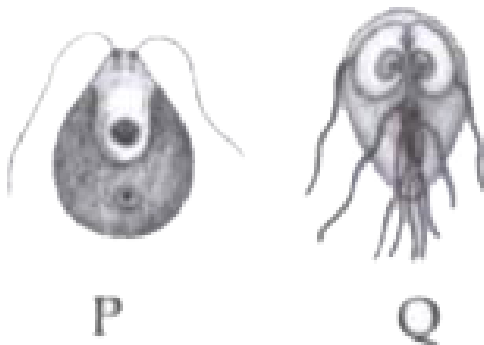
D. P-(i), Q-(iii), R-(iv), S-(ii), T-(vi), U-(v)

Answer: A



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9. Study the given figures and select the correct statements regarding these.



- (i) Organism P is a unicellular green alga.
- (ii) Organism Q is a parasitic protozoan.
- (iii) Organism Q causes diseases in human beings.

(iv) Both the organisms P and Q cannot synthesise their own food.

- A. (i) and (ii) only
- B. (ii), (iii) and (iv) only
- C. (i), (ii) and (iii) only
- D. (i), (ii), (iii) and (iv)

Answer: C



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10. The manufacture of bread, beer and wine involves alcoholic fermentation of glucose to ethanol by yeast. Which of the following five statements concerning this process are correct?

I. Yeast carries out fermentation because yeast cells lack mitochondria.

II. For every molecule of ethanol produced, one molecule of CO_2 evolves.

III. For every one molecule of glucose fermented, net two molecules of ATP are generated.

IV. More than 80% of the chemical energy of the glucose is released as heat.

V. Glycolysis is an integral part of this fermentation

A. II, III and IV

B. I, II, III and V

C. II, III and V

D. I, IV and V

Answer: C



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