PRISM WORLD

Std.: 10 (English) Science - II

Chapter: 7

Q.1 **Match the pair** **1**

1

Column "A"	Column "B"
i. Xylitol	a, Pigment
ii. Citric acid	b. To impart sweetness
iii. Lycopene	c. Microbial resistor
iv. Nycin	d. Protein-building emulsifier
	e. To impart acidity

Ans

i. Xylitol	To impart sweetness
ii. Citric acid	To impart acidity
iii. Lycopene	Pigment
iv. Nycin	Microbial resistor

Q.2 **Give scientific reasons** **12**

1 Which are the reasons for the increasing popularity of probiotic products?

Ans Probiotics are such edible preparations which contain useful active bacteria, like Lactobacillus, Acidophilus, Lactobacillus casei, Bifidobacterium bifidum, etc. There are various reasons for which probiotics are being promoted nowadays. These bacteria are beneficial for the intestine as they help in the process of metabolism. They are usually given when a person is suffering from diarrhoea or is under antibiotic treatment. Antibiotics kill both beneficial and harmful bacteria present in our body, thus affecting the metabolic process. These probiotics form the colonies of useful microbes in alimentary canal and thus aid in the digestion process.

2 Enzymes obtained from microbial process are mixed with detergent.

Ans i. Because, process of dirt / mark removal occurs at low temperature for due mixing of enzymes with detergents.
ii. Hence enzymes are eco-friendly.

3 Use of mutant strains has been increased in industrial microbiology.

Ans i. Mutant strains developed have helped to avoid unnecessary steps and materials thus saving time and labour.
ii. They have helped in the expansion of industries like fermentation and resultant products, production of raw materials for chemicals, enzymes, nutrients and medicines.
iii. Microbes are extensively used for garbage management and pollution control thus helpful in environmental management.

4 Microbial enzymes are used instead of chemical catalysts in chemical industry.
OR
Microbial enzymes are eco-friendly.

Ans Nowadays, instead of chemical catalysts, microbial enzymes are used in chemical industries because of the following reasons:
i. Microbial enzymes are active at a low temperature, pH, and pressure. Therefore, their use saves energy

and does not require erosion-proof instruments.

ii. They carry out specific processes, hence unnecessary by-products are not formed. Thus, expenses on purification are minimized.

iii. Use of microbial enzymes overcomes the necessity of waste elimination and decomposition.

iv. Enzymes can be reused for the next cycle of reaction. Hence, they are eco-friendly also.

5 How the bread and other products produced using baker's yeast are nutritious?

Ans Baker's yeast is commonly used in food production. It's major application is in the food industry where it is used in various baking procedures as well as for fermentation purposes. Fermentation of fruit juices, maple syrup, sugar molasses etc. with the help of yeast yields ethanol whereas it is used in baking bread and other products as it provides them with a fluffy and spongy characteristic. Apart from this, yeast is also a rich source of carbohydrates, fats, proteins, various vitamins, and minerals which means it also increases the nutritive value of the product to which it is added.

6 Microbial enzymes are used instead of chemical catalysts in chemical industry.

Ans i. Because enzymes are active at low temperature. pH and pressure; due to which energy is saved and erosion-proof instruments are also not necessary.

ii. Enzymes carry out specific processes; hence unnecessary byproducts are not formed due to which expenses on purification are minimised.

Q.3 Write properties/characteristics/uses/advantage/effects. **8**

1 Benefits of mixing ethanol with petrol and diesel.

Ans i. Petrol and diesel are fossil fuels which are non renewable and are also on the verge of exhaustion.

ii. On the contrary we can produce as much as ethanol as we want since we have large amount of biomass.

iii. This will reduce the consumption of fossil fuels

iv. Ethanol is a clean fuel and it reduces carbon monoxide emissions.

2 Importance of biopesticides in or ganic farming.

Ans i. Bacterial and fungal toxins which can destroy pests and pathogens can be directly integrated into plants with the help of biotechnology.

ii. Being toxic to insects, they do not consume the plants.

iii. Some species of fungi and viruses, spinosad, a byproduct of fermentation is a biopesticide.

iv. Biopesticides are important because they are ecofriendly and do not cause any harm to the soil, water or air.

3 What is role of microbes in compost production?

Ans i. In composting micro organism break down the organic matter and produce carbon dioxide, water and heat.

ii. Bacteria and fundi help in composting.

iii. Bacteria use variety of enzyme, to break down the complex organic matter like cellulose, lignin etc.

iv. Fungi like moulds and yeast also break down tough debris which enables bacteria to complete the decomposition.

4 Explain the importance of biopesticides in organic farming.

Ans i. By using bio pesticides, soil pollution is minimized. Otherwise by using chemical pesticides and fertilizers there is large scale soil pollution.

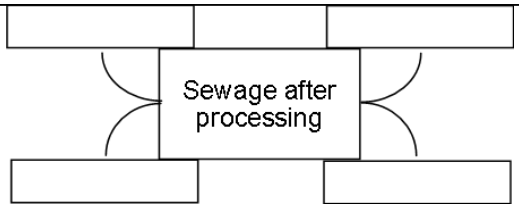
ii. When chemical pesticides are used in there is contamination of soil by fluoroacetamide-like chemicals.

iii. These are harmful to other plants, animals as well as for human beings. They may cause skin diseases in humans.

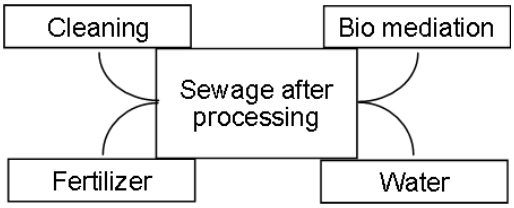
iv. By using bacterial and fungal toxins the pests and pathogens can be destroyed. Such toxins are directly incorporated in the plant materials. E.g. Spinosed is a biopesticide product as a by-product of fermentation.

Q.4 Complete the given flow chart / table **4**

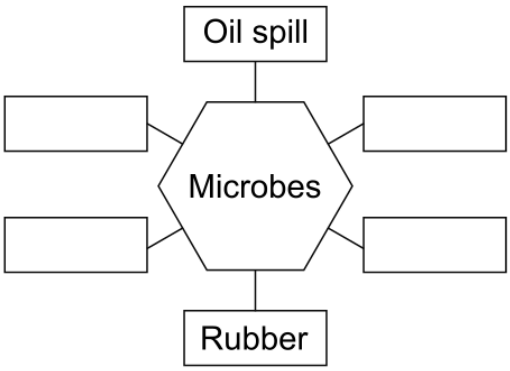
1 Complete the diagram of sewage after processing.



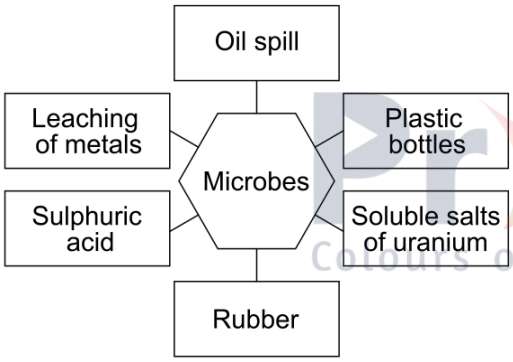
Ans



2 Complete the following conceptual picture related to environmental management.



Ans



Q.5 **Answer the following.** **4**

1 How can the soil polluted by acid rain be made fertile again?

Ans (i) Acid rain contains various acids such as carbonic acid, nitric acid, and sulphuric acid.
(ii) Sulphuric acid is a source of energy for some species of bacteria like Acidophilium spp. and Acidobacillus ferroxidens.
(iii) Hence, these bacteria can control soil pollution occurring due to acid rain.

2 Which fuels can be obtained by microbial processes? Why is it necessary to increase the use of such fuels?

Ans Natural gases (biogas, ethane, methane) can be obtained from the microbial process. It is necessary to use or increase this because it is man-made and natural gas so it is eco-friendly as well as heaper than other fuels and also it is a renewable source and for fuels.

Q.6 **Give examples** **6**

1 Which plants are cultivated to obtain fuel?

Ans Biofuels can be obtained from cultivating plants like corn, sugarcane, palm oil, jatropha, soybean, switchgrass and rapeseed.

2 Give example of Fuels obtained from biomass.

Ans i. Methane biogas
ii. ethoanol
iii.bio – diesel

iv. Hydrogen - by bio photolysis of water.
v. Gobar gas

3 Give examples of Plants cultivated to obtain fuels.

Ans i. Ethanol is the commonest biofuel which can be obtained by fermentation of sugar derived from: Sugar cane, Wheat, Sugar beets, Corn, molasses etc.
ii. Bio-diesel can be obtained from Jatropha, Castor oil, Cottan seed oil etc.

Q.7 Suggest remedies / measures **9**

1 How can the oil spills of rivers and oceans be cleaned?

Ans (i) Spilling of petroleum oil in oceans and rivers occurs due to various reasons.
(ii) This oil may prove fatal and toxic to aquatic organisms.
(iii) It is not easy to remove the oil layer from the surface of water by mechanical method.
(iv) However, bacteria like Pseudomonas spp. and Alcanovorax borkumensis have the ability to destroy the pyridines and other chemicals in petroleum.
(v) Hence, these bacteria are used to clear the oil spills. These are known as hydrocarbonoclastic bacteria (HCB).
(vi) HCB decompose the hydrocarbons and bring about the reaction of carbon with oxygen. CO_2 and water is formed in this process, thus cleaning the oil spills in oceans and rivers.

2 Which precautions are necessary for proper decomposition of domestic waste?

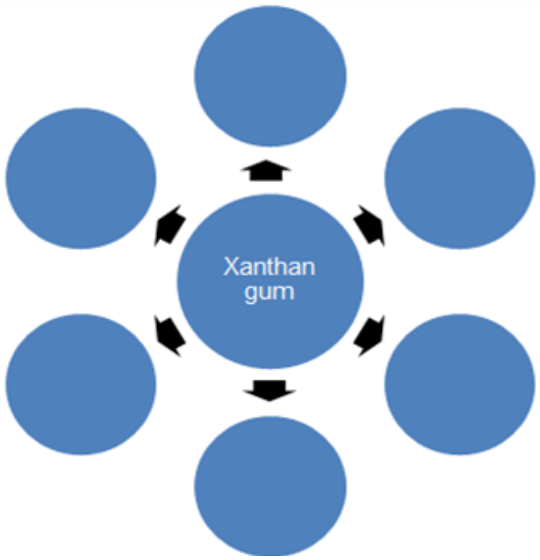
Ans The precautions to be taken for proper decomposition of domestic waste are:
i. Wet and dry waste should be properly segregated.
ii. Bio-medical waste, e-waste, etc. should not be mixed with wet waste.
iii. After segregation, the waste should be disposed of carefully.
iv. Medical waste should be incinerated to prevent the spread of infection.
v. Dry waste and e-waste should be sent for recycling.
vi. Wet waste should be completely free of any nonbiodegradable matter. This can then be converted to compost.

3 State any 3 precautions taken for proper decomposition of domestic waste.

Ans i. Domestic wastes should be properly segregated into dry and wet. Only wet wastes which are degradable should be let into the landfill.
ii. Compressed waste should be covered with layers of soil, saw dust, leafy waste and specific biochemical.
iii. Completely filled pet should be sealed with soil slurry so that the bacteria present in the soil and other top layers can decompose the wastes quickly.

Q.8 Complete the table/ web/ flow chart **3**

1 Complete the chart of Xanthan gum.



Ans

Q.9 **Answer the following** **9**

1 Which fuels are obtained from biomass?

Ans Fuels which are obtained from biomass are called biofuels and they are an important and renewable source of energy. Biofuels can be in the form of either solid, liquid or gases.
Solid biofuels - coal, dung, crop residue
Liquid - vegetable oils, alcohol
Gaseous - gobar gas, coal gas

2 Why is it necessary to ban the use of plastic bags?

Ans
i. Plastic bags pollute our land, and water, litter our land – scapes, choke up drainages and cause floods, and finally reach the ocean harming the marine life.
ii. Plastic bags do not decompose completely and the manufacturing process is energy intensive
iii. Plastic bags and pieces are mistaken for food by animals and birds both on land and water congesting their digestive system and harming them.
iv. Plastic bags are not easy to recycle and harmful to human. Plastic fragments reach humans through food charni and can even cause cancer.

3 How does the bread become spongy?

Ans Breads become spongy due to the addition of yeast in their dough. Yeast reproduces rapidly and produces carbon dioxide gas while respiring. This gas fills the dough and increases its volume making it to rise, thus making the bread appear spongy and fluffy.

Q.10 **Answer the following in detail** **5**

1 Rewrite the following statements using the correct option and explain the completed statement.
(gluconic acid, coagulation, amino acid, acetic acid, Clostridium, Lactobacilli)
(a) Process of ..... of milk proteins occurs due to lactic acid.
(b) Harmful bacteria like ..... in the intestine are destroyed due to probiotics.
(c) Chemically, vinegar is .....
(d) Salts which can be used as supplement of calcium and iron are obtained from ..... acid.

Ans (a) Process of ..... of milk proteins occurs due to lactic acid.
(i) Milk is used to obtain various dairy products like cheese, butter, cream, and kefir using microbes.
(ii) Milk is pasteurized at the beginning to destroy unwanted microbes.
(iii) It is then fermented with the help of Lactobacilli.
(iv) In this process, lactose sugar of milk is converted into lactic acid. This lactic acid helps in coagulating the milk proteins, and liquid milk is converted into semi-solid curd.
(b) Harmful bacteria like Clostridium in the intestine are destroyed due to probiotics.
(i) Probiotics are milk products that contain active bacteria, e.g. Lactobacillus, Acidophilus, Lactobacillus casei, and Bifidobacterium bifidum.
(ii) These microbes maintain the balance of intestinal microorganisms by increasing the

population of useful microbes that help digestion and decreasing the population of harmful microbes like Clostridium.

(c) Chemically, vinegar is acetic acid.

(i) Vinegar is used to impart sour taste to food items and preserve pickles, sauce, ketchup, chutneys, etc.

(ii) Mixture of bacterial strains like Acetobacter and Glucanobacter is mixed with ethanol for its microbial degradation. Acetic acid and other byproducts are obtained through it.

(iii) Acetic acid is separated from the mixture by rarefaction.

(iv) Acetic acid is bleached with the help of potassium ferrocyanide. Then, it is pasteurized. Finally, very small quantity of SO_2 gas is mixed to produce vinegar.

(d) Salts which can be used as supplement of calcium and iron are obtained from gluconic acid.

(i) Certain microbes break down the carbohydrates in food materials.

(ii) E.g. Aspergillus niger is used to break down glucose and corn steep liquor to produce gluconic acid. This acid is used in the production of certain minerals which are used as supplements for calcium and iron.