PRISM WORLD

Std.: 10 (English) **Science - II**

Chapter: 8

Q.1 **Rewrite the following wrong statements after corrections.** **2**

1 Gene from Bacillus thuringiensis is introduced into soyabean.

Ans Gene from Bacillus thuringiensis is introduced into brinjal.

2 Changes in genes of the cells are brought about in non-genetic technique.

Ans Changes in the genes of the cells are brought about in biotechnology (genetic technique).

Q.2 **Find co-related terms** **5**

1 White revolution : Dairy :: Blue revolution : ……

Ans White revolution : Dairy :: Blue revolution : **Pisciculture**
Pisciculture. White revolution is related to dairy industry; blue revolution is related to pisciculture.

2 Interferon : ..... : : Erythropoietin : Anaemia

Ans Interferon : **Viral infection** : : Erythropoietin : Anaemia
Viral infection. Interferon is the protein used to treat viral infection; erythropoietin is the protein used to treat anaemia.

3 Insulin : Diabetes : : Interleukin : .....

Ans Insulin : Diabetes : : Interleukin : **Cancer**
Insulin is used to treat diabetes; interleukin is used to treat cancer.

4 Nostac, Anabaena : Biofertilizers :: Alfalfa : ……

Ans Nostac, Anabaena : Biofertilizers :: Alfalfa : **Phytoremediation.**

5 ..... : Dwarfism : Factor VIII : Hemophilia

Ans **Somatostatin** : Dwarfism : Factor VIII : Hemophilia
Somatostatin. Somatostatin is used to treat dwarfism; factor VIII is used to treat haemophilia.

Q.3 **Match the pair** **3**

1

Column "A"	Column "B"
i. Interferon	a. Hemophilia
ii. VIII Factor	b. Cancer
	c. Viral infection

Ans

i. Interferon	Viral infection
ii. VIII Factor	Hemophilia

2

Column "A"	Column "B"
i. Interferon	a. Diabetes
ii. Factor VIII	b. Dwarfness

iii. Somatostatin	c. Viral infection
iv. Interleukin	d. Cancer
	e. Haemophilia

Ans

i. Interferon	Viral infection
ii. Factor VIII	Haemophilia
iii. Somatostatin	Dwarfness
iv. Interleukin	Cancer

3

Column "A"	**Column "B"**
i. Somatostatin	a. Diabetes
ii. Interleukin	b. Dwarfness
	c. Cancer

Ans

i. Somatostatin	Dwarfness
ii. Interleukin	Cancer

Q.4 Give scientific reasons **2**

1 Why some of the organism in human body are most valuable ?

Ans Various organs in the human body become less efficient or completely functionless due to aging, accidents etc. But if a person gets the necessary organs on him life can be saved. Organ like kidney and skim can be easily donated and transplanted even when we are alive. But organs like lives, heart and eyes can be donated only after death and hence such organs are most valuable.

Q.5 Write Short Notes on **4**

1 Importance of medicinal plants.

Ans (i) India has been gifted with a great biodiversity.
(ii) Indian citizens have established a humble and strong relation with the nature.
(iii) We have a great tradition of ayurveda that cures diseases with the help of natural resources.
(iv) In the past, medicinal plants were collected from forests. However, forest depletion has made them rare. Hence, they are being cultivated. Some examples of medicinal plants and their uses are as follows: adulsa - used for cough, aloevera - used for healing wounds and taken orally to reduce cholesterol, tulsi - for cold and flu, neem - to cure diabetes and gastric problems.
(v) Apart from medicinal uses, these plants are also used in pest control, perfumes, food products, natural dyes, etc.

2 Biotechnology – Commercial/Professional uses
Or
What are the uses of biotechnology?

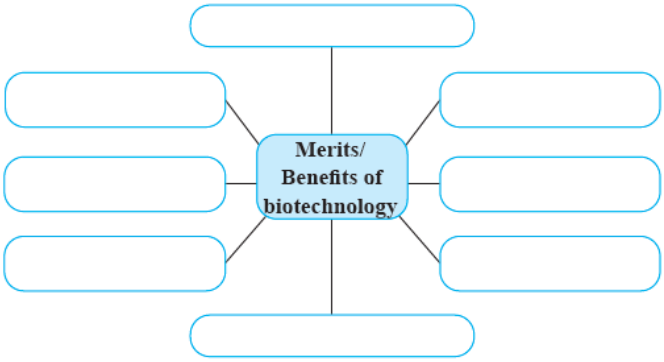
Ans (i) Biotechnology is used in almost all fields; some are mentioned below:
(a) **Agriculture:** Biotechnology is used in agriculture to develop genetically modified crops, biofertilizers, herbicides, etc.
(b) **Human health:** Biotechnology helps to identify the role of genes, if any, in various diseases, e.g. diabetes and heart diseases. It is also used to produce hormones and vaccines and in gene therapy.
(c) **Industrial products:** To form alcohol products from sugar molasses with

the help of transgenic yeast and to make food items like bread, cheese, wine, and yoghurt.

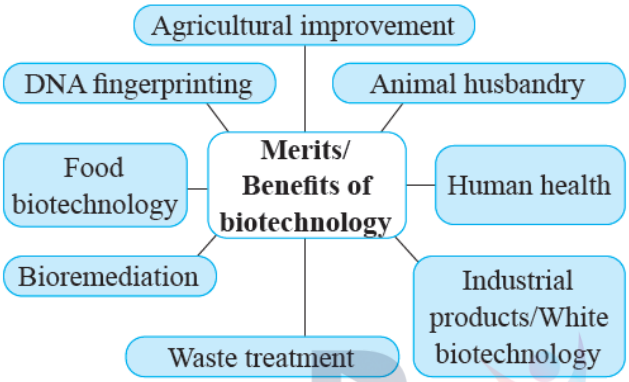
(ii) Biotechnology has contributed to considerable progress in professional / commercial areas such as agriculture, health, pharmacy, industrial products and environment.

Q.6 **Complete the given flow chart / table** **2**

1



Ans



Q.7 **Answer the following.** **6**

1 Why are some organs in human body most valuable? Or Some of the organs in the human body are precious. Give scientific reason.

Ans (i) Certain organs like liver, heart, etc. are very important as one cannot survive without them. If they are removed from the body, one would die. Hence, all these organs are very valuable.

(ii) In fact, these organs remain functional for some time after a person's death. Hence, they are donated with the person's written permission. So, these organs are very valuable as they can better
someone's life or give them life.

(iii) For example, A blind person can gain vision because of someone's eyes. Life of people can be rendered comfortable by organ donation.

2 Which precautions, will you take during spraying of pesticides? Or What precaution should be taken while using insecticides?

Ans Pesticides are used to kill pests that harm crop plants. These pesticides are usually poisonous chemicals. This poison enters the food web.
Precautions to be taken are as follows:

(i) Pesticides should be sprayed only as much as required.
(ii) Care should be taken that they do not run off into water bodies.
(iii) One should avoid splashing, spilling, and leakage of pesticides.
(iv) Exposure to pesticides while spraying/handling should be avoided.
(v) Mouth and nose should be covered by cloth so that pesticides do not enter into the body.

3 Which products, produced through biotechnology, do you use in your daily life? Or Write the things in day-to-day life made by biotechnology.

Ans (i) **Food:** All the genetically modified crops that give us daily food are now grown using biotechnology.

(ii) **Milk and milk products:** Milk products like cheese, yoghurt, and butter are prepared nowadays using biotechnological processes.

(iii) **Biofuels:** These are made by mixing alcohol and diesel. Alcohol is obtained by the fermentation of molasses using yeast.

(iv) **Medicines:** Various medicines used for the treatment of diseases are also obtained from certain microorganisms.

Q.8 Suggest remedies / measures **3**

1 What precautions will you take during spraying of pesticides ?

Ans 1. Person, spraying insecticides must wear protective master and clothing to present inhalation and direct contact with peptides.

2. Pesticides are in feat polonies. There polonies enter the food web through water and food and bio-magnification occurs.

3. Hence minimum and hinted use of pesticides is a must since there are extremely dangerous and damage our ecosystem.

Q.9 Write answers with explanations. **6**

1 Explain the importance of fruit processing in human life?

Ans i. Everyday, we use various products prepared from fruits.

ii. All are consuming the products such as chocolates, juices, jams and jellies.

iii. All these products can be produced by processing fruits.

iv. Fruits are perishable agro-produce.

v. Fruit processing is done in such a way that even seasonal fruits can be used throughout the year.

vi. Fruit processing includes various methods ranging from cold storage to drying, salting, airtight packing, evaporating moisture, preparing murabba, juices, sauces, etc.

2 Explain the meaning of vaccination. Or What is meant by vaccination? What is the safest method of vaccination?

Ans (i) Vaccination is the process of administering a vaccine into the body of a person to impart either permanent or temporary immunity against a specific pathogen or a disease.

(ii) Vaccine is the antigen-containing material given to impart permanent or temporary immunity against a specific disease.

(iii) Traditionally, completely or partially killed pathogens were used as vaccines. However, due to this, there were chances of contracting the disease. Hence, as an alternative, scientists tried to produce vaccines with the help of biotechnology.

(iv) Using biotechnology, the antigen is produced in the laboratory with the help of a gene isolated from the pathogen and used it for vaccination. Hence, safer vaccines are being produced.

(v) Nowadays, proteins which act as antigens are injected. These proteins keep the immune system active.

(vi) Thus, injecting the antigens is the safest way of vaccination.

Q.10 Answer the following **3**

1 Explain the importance of medicinal plants in India.

Ans i. The term of medicinal plants include a various types of plants used in herbalism and some of these plants have a medicinal activities.

ii. These medicinal plants are considered as rich resources of ingredients which can be used in drug development and synthesis.

iii. India has been gifted with a great biodiversity. We have a great tradition of ayurveda that cures the diseases with the help of natural sources.

iv. During earlier days, medicinal plants were collected from the forest. These days due to depletion in forest area, medicinal plants are becoming rare.

v. Hence, medicinal plants are being cultivated.

Q.11 Answer the following in detail **10**

1 Explain Biotechnology : Professional uses.

Ans i. **Crop Biotechnology :** Biotechnology is used in agricultural field to improve yield and variety.

ii. **Hybrid Seeds :** Genes of two different crops are recombined to form hybrids of various crops. This is especially useful for fruits.

iii. **Genetically Modified Crops :** Crops developed with desired characters by integrating foreign gene with their genome are called as genetically modified crops. High yielding varieties with resistance to diseases, alkalinity, weeds other stresses like cold and drought. Examples BT Cotton, BT Brinjal, Golden Rice, Herbicide tolerant plants

iv. **Biofertilizers :** Due to use of biofertilizers instead of chemical fertilizers, nitrogen fixation and phosphate solubilization abilities of the plants are improved. Mainly the bacteria like Rhizobium, Azotobacter, Nostoc, Anabaena and plants like Azolla are used as biofertilizers.

v. **Tissue culture :** Genetic improvement of the plants has become possible due to tissue culture and besides, those characters inherited to next generation.

vi. **Animal Husbandry:** Two main methods as artificial insemination and embryo transfer are used in animal husbandry. It helps to improve both, the quantity and quality of animal products. Ex. Milk, meat, wool, etc. Similarly, animals with more strength have been developed for hard work.

vii. **Human Health :** Diagnosis and treatment of the diseases are two important aspects of the human health management. Biotechnology helps to identify the role of gene, if any, in disease of a person.

viii. **Treatment :** Biotechnology is useful for production of hormones like insulin, somatotropin and blood clotting factors.

ix. **Interferon :** This is a group of small sized protein molecule used in treatment of viral diseases. These are produced in blood. Nowadays, with the help of biotechnology, transgenic E. coli are used for production of interferon.

x. **Gene therapy :** Gene therapy to treat genetic disorders in somatic cells has become possible due to biotechnology. Ex. Phenylketonuria (PKT) arises due to genetic changes in hepatocytes (liver cells). It has become possible to treat it with gene therapy. This method is called as somatic cell gene therapy. All the cells except sperms and ova in the body are called as somatic cells.

xi. **Cloning :** Production of replica of any cell or organ or entire organism is called cloning.

xii. **Industrial Products / White Biotechnology** : Various industrial chemicals can be produced through less expensive processes. Example: Alcohol production from sugar molasses with the help of transgenic yeast.

xiii. **Environment and Biotechnology :** It has become possible to solve environment related various problems with the help of biotechnology.

xiv. **Food Biotechnology :** Food items like bread, cheese, wine, beer, yoghurt, vinegar are produced with the help of microorganisms. These food items are probably the oldest ones produced with the help of biotechnology.

xv. **DNA fingerprinting :** It is mainly useful in forensic sciences to Identity criminal with the help of any part of its body found at the site of crime; identity father of any child can be established. This research is performed in Center for DNA fingerprinting and Diagnostics, Hyderabad.

2 Write a comparative note on usefulness and harmfulness of biotechnology. OR
'Biotechnology is not only beneficial, but it has some harmful effects too.' Express your opinion about this statement.

Ans i. Biotechnology has brought about considerable progress in various fields.

ii. Biotechnology is improving human welfare by means of artificial genetic changes and hybridization in organisms.

iii. **Agriculture:** Crop biotechnology is used to improve yield and variety of crops to produce genetically modified crops, biofertilizer, etc.

iv. **Animal husbandry:** Biotechnology has improved the quantity and quality of animal products and developed animals with more strength.

v. **Human health:** Biotechnology has made possible quick diagnosis and treatment of diseases, insulin production, production of interferons using E.Coli, and production of safer vaccines.

vi. **Edible vaccines:** Edible vaccines are produced with the help of biotechnology.

vii. **Gene therapy:** Some genetic disorders like Phenylketonuria can be cured with the help of biotechnology.

viii. **Cloning:** Reproductive and therapeutic cloning is possible due to biotechnology.

ix. **Less expensive processes** have been developed for production of various industrial products like
alcohol.

Environment: Biotechnology as helped to solve various environmental issues, such as

x. treatment of
sewage and solid waste.

xi. **Food:** Biotechnology is used in the preparation of food items like bread, cheese, yoghurt, etc.

xii. **DNA fingerprinting:** is made possible due to biotechnology.

Biotechnology has indeed done a lot of good for the world, but there are also disadvantages and concerns.

Q.12 **Fill in the blank and rewrite the completed statements** **1**

1 ..... is the revolutionary event in biotechnology after cloning.

Ans **Stem cell research,** is the revolutionary event in biotechnology after cloning.