



# BIOLOGY

## BOOKS - TARGET PUBLICATION

### CELL BIOLOGY AND BIOTECHNOLOGY

**Choose The Correct Alternative**

1. Stem cells are present in

A. umbilical cord

B. bone marrow

C. adipose connective tissue

D. all of the above

**Answer: D**



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2. Stem cell samples are preserved at

A.  $-135^{\circ}C$  to  $-190^{\circ}C$

B.  $0^{\circ}C$  to  $10^{\circ}C$

C.  $-45^{\circ} C$  to  $90^{\circ} C$

D.  $20^{\circ} C$  to  $40^{\circ} C$

**Answer: A**



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**3. Which of the following factor(s) is important while considering organ transplantation?**

A. Blood group of the recipient

B. Disorders of the donor

C. Age of the donor

D. all of the above

**Answer: D**



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4. Golden rice is an improved variety of rice developed for increased \_\_\_ content.

A. Vitamin-A

B. protein

C. Vitamin B

D. oil

**Answer: A**



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5. The disease related with the synthesis of insulin is \_\_

A. diabetes

B. phenylketonuria

C. haemophilia

D. anaemia

**Answer: A**



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6. Vaccines contain \_\_\_\_\_

A. inactivated/weakened antigens

B. antibiotics

C. killed pathogens

D. Both (A) and ( C)

**Answer: D**



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7. vaccines activate the

A. nervous system

B. immune system

C. circulatory system

D. respiratory system

**Answer: B**



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**8.** Phenylketonuria is a genetic change in \_\_\_ cells.

A. liver

B. skin

C. heart

D. lungs



**Answer: A**



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**9. Bacteria used as biofertilizer is**

- A. Escherichia
- B. Deinococcus
- C. Nostoc
- D. all of the above

**Answer: C**



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10. A clone is produced by fusion of nucleus of somatic cell with an enucleated

A. sperm

B. ovum

C. stem cell

D. hepatocyte

**Answer: B**



11. Sewage should be released into rivers only after microbial treatment that results in

- A. oxidation
- B. coagulation
- C. polymerization
- D. fermentation

**Answer: A**



## Complete The Paragraph

1. Select the appropriate options and complete the following paragraph.

( organic farming, humus, oxidation, increase, pesticides, fertilizers, nitrogen, biomagnification, decrease)

The uppermost layer of soil is made up of --- that is essential in agriculture. Essential elements like \_\_\_, phosphorous and potassium need to be made available to the crop plants.

Chemicals used in agriculture, \_\_\_ the fertility of soil. Use of \_\_\_ like DDT have also proved to be dangerous, since the poison enters the food-web and causes problems due to \_\_\_ of the compound. To overcome these problems, farmers are opting for the practice of \_\_\_ .



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**Name The Following**

1. The study of the structure, types and organelles of the cell.



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2. Donation of organs like eyes and heart after the death of a person.



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**3.** Non-genetic biotechnological techniques used in agriculture.



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**4.** Technique used to develop high-class varieties of crops.



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5. Viral disease of ruminants that can be prevented if cattle chew on a particular transgenic variety of tobacco.



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6. Process of production of replica of any cell or organ or an entire organism.



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## 7. Bacteria used as biofertilizers



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8. Name the products obtained by biotechnology for treatment of diseases.



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9. Research institutes and laboratories that are involved in development of new varieties

of crops



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**10.** Technique of absorption or destruction of toxic chemicals and pollutants with the help of plants and microorganisms.



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**11.** Technique used in forensic sciences and paternity testing.



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## 12. Method of soil-less farming



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## 13. Essential elements provided to crops by fertilizers



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## 14. Chemical pesticides used in agriculture



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## 15. Products of fruit-processing



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## 16. Food processing techniques used for storage of fruits



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## True Or False If False Write The Correct Sentence

1. Stem cell research is the revolutionary event in biotechnology after cloning.



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2. Stem cells are present in the blastocyst stage of embryonic development.



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3. The cells of the embryo undergo repeated meiotic divisions.



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4. Embryonic cells before differentiation are called embryonic stem cells.



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5. Adult stem cells can be obtained from blood.



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6. Different types of cells give rise to specialised stem cells in multicellular organisms.



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



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8. Human growth hormone can be produced by genetically modified bacteria.



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9. To produce Bt cotton, the gene responsible for toxin production is isolated from *Bacillus thuringiensis* and integrated with the gene of the cotton plant.



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10. Gene from *Bacillus thuringiensis* is introduced into soybean.



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**11.** Golden rice produces around 23· times more amount of beta carotene.



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**12.** Methods like artificial insemination and embryo transplant are mainly used for animal husbandry.



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**13.** Escherichia coli is used for the production of interferons.



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**14.** The vaccines produced using biotechnology are not thermo-stable.



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**15.** All cells of the body except sperm and ova are called germ cells.



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**16.** Pteris vittata, alfalfa, clover, and rye are plants used for phytoremediation.



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**17.** Oil digesting and fast multiplying bacteria can be used to clean oil spillage in oceans.



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**18.** Dr. Norman Borlaug (USA) and Dr. M. S. Swaminathan (India) have valuable contribution in white revolution.



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**19.** Government of India has encouraged the people of pisciculture for improving the productivity by launching NKM -16.



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**20.** Manures can be used to improve water holding capacity of the soil.



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21. Fruits are imperishable agro-products.



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## Odd One Out

1. Frog, earthworm, bollworm, insectivorous birds



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2. DDT, humus, malathion, chlorpyrifos



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3. Sornatotropin, blood clotting factors,  
malathion, interferons



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4. Bt Cotton, hydroponics, Bt brinjal, golden  
rice





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5. Diabetes, Anaemia, Leukemia, Thalassemia



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## Complete The Analogy

1. Crop resistant -to bollworm : Bt cotton::

Crop synthesizing large quantities of vitamin

A: \_\_\_\_\_



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2. Phenylketonuria: Gene therapy:: Polio:

-----



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



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4. Interferon: \_\_\_\_\_ :: Erythropoietin: Anemia



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5. \_\_\_\_\_ :Dwarfism:: Factor VIII: Hemophilia



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6. Sunflower: Arsenic:: Deinococcus: \_\_\_\_\_



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7. White revolution : Dairy :: Blue revolution :

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8. White revolution : Increase in dairy production :: Green revolution : \_\_\_\_\_



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9. Apiculture: Bees :: Vermiculture: \_\_\_\_\_

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## Match The Following

1. Match the following columns

	<b>Column I</b>		<b>Column II</b>
i.	Hepatocytes	a.	Blood cells
ii.	Osteocytes	b.	Liver cells
		c.	Bone cells
		d.	Intestinal cells



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## 2. Match the following columns

	<b>Column I</b>		<b>Column II</b>
i.	Interferon	a.	Diabetes
ii.	Factor VIII	b.	Dwarfism
iii.	Somatostatin	c.	Viral infection
iv.	Interleukin	d.	Cancer
		e.	Hemophilia



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## 3. Match the following columns

	<b>Column I</b>		<b>Column II</b>
i.	<i>Pteris vittata</i>	a.	Cleans hydrocarbon and oil pollutants from soil and water
ii.	<i>Pseudomonas</i>	b.	Absorbs radiations
		c.	Absorbs arsenic from soil



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## Answer The Following

1. Define stem cells? Mention two types of stem cells



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2. What is pluripotency ?



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3. Write a note on preservation of stem cells.



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4. Write a note on culturing embryonic stem cells in the laboratory.



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5. What is the importance of stem cells in medical science?





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**6. Mention any four factors to consider during organ transplantation?**



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**7. Why some of the organs in human body are most valuable?**



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**8.** What is biotechnology?



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**9.** Give examples of branches of biotechnology.



**Watch Video Solution**

**10.** Enlist any four benefits of biotechnology in improving agricultural yields.



**Watch Video Solution**

**11.** Write a short note on benefits of biotechnology in improving agricultural yields.



**Watch Video Solution**

**12.** Explain in detail how biotechnology can be useful in agriculture.



**Watch Video Solution**

**13.** Write a short note on genetically modified Bt crops.



**Watch Video Solution**

**14.** Microbes play an important role in agricultural management. Explain the given statement.



**Watch Video Solution**

**15.** What is the impact of biotechnology on animal products?



**Watch Video Solution**

**16.** Explain the meaning of vaccination.



**Watch Video Solution**

**17.** Write a short note on vaccination.



**Watch Video Solution**

**18.** what are the advantages of producing vaccines by biotechnology?



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**19.** Explain the process of production of edible vaccines with a neat diagram.



**Watch Video Solution**

**20.** Describe in brief the steps involved in production of edible vaccines with a neat diagram.



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**21.** Explain somatic cell gene therapy with an example.



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**22.** Write a short note on cloning.



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**23.** Explain in detail the importance of biotechnology in human health.



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**24.** Write a note on the cloning of the sheep, 'Dolly'.





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**25.** Which products produced through biotechnology do you use in your daily life?



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**26.** What are the main areas of biotechnology?



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**27.** Write a short note on Biotechnology - Professional uses.



**Watch Video Solution**

**28.** Explain any two commercial applications of biotechnology.



**Watch Video Solution**

**29.** Write a comparative note on usefulness and harmfulness of biotechnology.



**Watch Video Solution**

**30.** What is white biotechnology?



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**31.** Define bioremediation with two examples.



**Watch Video Solution**

**32.** Give four examples of plants used for phytoremediation



**Watch Video Solution**

**33.** Give four examples of food items that are produced with the help of microorganisms



**Watch Video Solution**

**34.** What is green revolution? Give two examples of improved crops that contributed to green revolution.



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**35.** Give four examples of aquatic organisms that are cultured on a large scale.



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**36.** Which precautions will you take during spraying of pesticides?



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**37.** What is the difference between conventional and modern techniques of honey collection in apiculture?



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**38.** Write a short note on the importance of medicinal plants.



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**Give Reasons**

**1.** Explain the importance of fruit-processing in human life.



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2. Herbicide tolerant crop plants are beneficial in agriculture.



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3. Sewage should be released in rivers only after oxidation by microbial techniques.



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4. DNA fingerprinting is useful in forensic sciences and paternity testing.



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5. Organic farming is a currently preferred approach in agriculture.



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## 6. Fill the following blanks

	Plants/Microbes	Function
i.	<i>Pteris vittata</i>	.....
ii.	<i>Pseudomonas</i>	.....
iii.	.....	Absorption of uranium and arsenic
iv.	.....	Absorption of radiations of nuclear waste



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## Complete The Given Chart Table

1. Organic farming is a currently preferred approach in agriculture.



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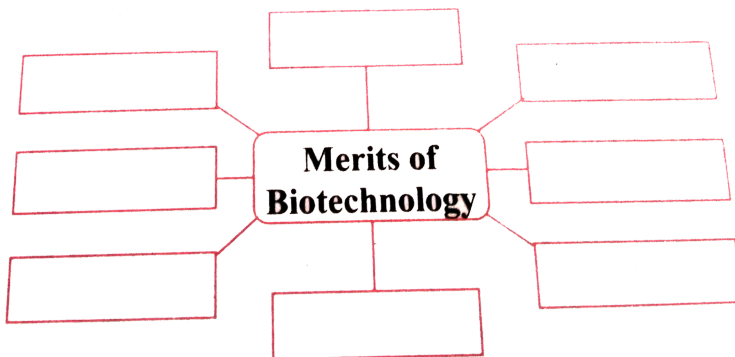
## 2. Fill the following blanks

	Plants/Microbes	Function
i.	<i>Pteris vittata</i>	.....
ii.	<i>Pseudomonas</i>	.....
iii.	.....	Absorption of uranium and arsenic
iv.	.....	Absorption of radiations of nuclear waste



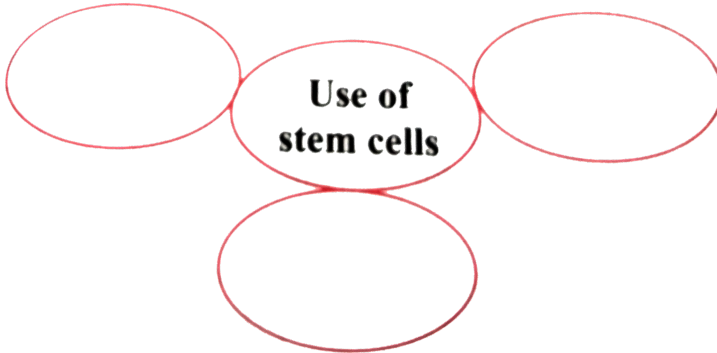
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## 3. Fill the following blanks



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4. Fill the following blanks



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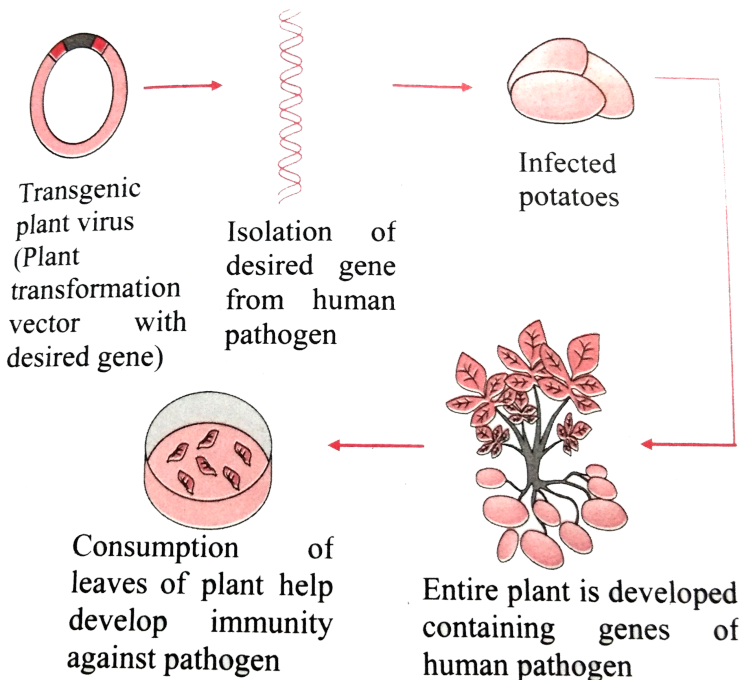
5. Draw a flowchart representing steps involved in production of edible vaccines.



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# Question Based On Diagram

## 1. Identify the process



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## Question Based On Paragraph

1. Read the following extract and answer the questions that follow:

A liberal view behind the concept of organ and body donation is that after death our body should be useful to other needful persons so that their miserable life would become comfortable. Awareness about these concepts is increasing in our country and people are voluntarily donating their bodies. Life of many can be saved by organ and body donation.

Blinds can regain their vision. Life of many people can be rendered comfortable by donation of organs like liver, kidneys, heart, heart valves, skin, etc. Similarly, body can be made available for research in medical studies. Many government and social organizations are working towards increasing the awareness about body donation.

What is the liberal view behind the organ and body donation?



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2. Read the following extract and answer the questions that follow:

A liberal view behind the concept of organ and body donation is that after death our body should be useful to other needful persons so that their miserable life would become comfortable. Awareness about these concepts is increasing in our country and people are voluntarily donating their bodies.

Life of many people can be saved by organ and body donation. Blinds can regain their vision.

Life of many people can be rendered comfortable by donation of organs like liver,



kidneys, heart valves, skin etc. Similarly, body can be made available for research in medical studies. Many government and social organization are working towards increasing the awareness about body donation.

ii) Name any four organs that can be donated.



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**3.** Diseases in humans can be prevented by administration of vaccines. Vaccines contain inactivated, killed / weakened pathogens that

can be used as antigens to provide either permanent or temporary immunity against a specific pathogen or disease. Conventional methods of vaccine preparation include the use of completely or partially killed pathogens. These vaccines however posed a risk of causing disease in case of some persons. Biotechnological techniques provide alternative antigenic genes isolated in the laboratory that can be used to make pure forms of proteins that can be used as antigens to activate the immune system. Recent developments in this field include production

of edible vaccines like transgenic potatoes. Consumption of raw potatoes is speculated to develop immunity against the pathogen. These edible vaccines are produced by inserting genes isolated from specific pathogens to produce the antigen in the plants. Based on the given paragraph answer the following questions.

i) How can people immunized with vaccines containing semi-killed pathogens have a risk of contracting a disease?



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4. Diseases in humans can be prevented by administration of vaccines. Vaccines contain inactivated, killed / weakened pathogens that can be used as antigens to provide either permanent or temporary immunity against a specific pathogen or disease. Conventional methods of vaccine preparation include the use of completely or partially killed pathogens. These vaccines however posed a risk of causing disease in case of some persons. Biotechnological techniques provide alternative antigenic genes isolated in the

laboratory that can be used to make pure forms of proteins that can be used as antigens to activate the immune system. Recent developments in this field include production of edible vaccines like transgenic potatoes. Consumption of raw potatoes is speculated to develop immunity against the pathogen. These edible vaccines are produced by inserting genes isolated from specific pathogens to produce the antigen in the plants. Based on the given paragraph answer the following questions.

Why are vaccines produced using

biotechnology safer than conventional vaccines?



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5. Diseases in humans can be prevented by administration of vaccines. Vaccines contain inactivated, killed / weakened pathogens that can be used as antigens to provide either permanent or temporary immunity against a specific pathogen or disease. Conventional methods of vaccine preparation include the

use of completely or partially killed pathogens.

These vaccines however posed a risk of causing disease in case of some persons.

Biotechnological techniques provide alternative antigenic genes isolated in the

laboratory that can be used to make pure

forms of proteins that can be used as antigens

to activate the immune system. Recent

developments in this field include production

of edible vaccines like transgenic potatoes.

Consumption of raw potatoes is speculated to

develop immunity against the pathogen.

These edible vaccines are produced by

inserting genes isolated from specific pathogens to produce the antigen in the plants. Based on the given paragraph answer the following questions.

How does the immune system react on administration of vaccines?



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**6.** Diseases in humans can be prevented by administration of vaccines. Vaccines contain inactivated, killed / weakened pathogens that



can be used as antigens to provide either permanent or temporary immunity against a specific pathogen or disease. Conventional methods of vaccine preparation include the use of completely or partially killed pathogens. These vaccines however posed a risk of causing disease in case of some persons. Biotechnological techniques provide alternative antigenic genes isolated in the laboratory that can be used to make pure forms of proteins that can be used as antigens to activate the immune system. Recent developments in this field include production

of edible vaccines like transgenic potatoes. Consumption of raw potatoes is speculated to develop immunity against the pathogen. These edible vaccines are produced by inserting genes isolated from specific pathogens to produce the antigen in the plants. Based on the given paragraph answer the following questions.

What is the disadvantage of transgenic potatoes containing edible vaccines?



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7. Diseases in humans can be prevented by administration of vaccines. Vaccines contain inactivated, killed / weakened pathogens that can be used as antigens to provide either permanent or temporary immunity against a specific pathogen or disease. Conventional methods of vaccine preparation include the use of completely or partially killed pathogens. These vaccines however posed a risk of causing disease in case of some persons. Biotechnological techniques provide alternative antigenic genes isolated in the laboratory that can be used to make pure

forms of proteins that can be used as antigens to activate the immune system. Recent developments in this field include production of edible vaccines like transgenic potatoes. Consumption of raw potatoes is speculated to develop immunity against the pathogen. These edible vaccines are produced by inserting genes isolated from specific pathogens to produce the antigen in the plants. Based on the given paragraph answer the following questions.

What is the main advantage of vaccines over antibiotics?



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## Apply Your Knowledge

1. What is cell?



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2. What is tissue? Which are the functions of tissue?



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3. Which technique in relation to tissues have you studied in earlier classes?



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4. Which are the various processes in tissue culture?



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5. We have studied the plant production by technique of tissue culture in the last class. Stem cells are used for that purpose. Whether such stem cells are present in animals?



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6. Assign names in the figure given on textbook page no. 88. Explain the various stages those are kept blank.



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7. Just like the grafting in plants, is organ transplantation possible in humans?



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8. Discuss about stem cells and organ transplantation in the class with the help of figures given on page no. 90 of your textbook.



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9. Visit the websites -

<http://www.who.int/transplantation/organ/en/>  
[www.organindia.org/approaching-thetransplant/](http://www.organindia.org/approaching-thetransplant/) and collect more information about 'brain dead', organ donation and body donation.



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10. What is biotechnology?



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**11.** In which various fields, biotechnology has been useful?



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**12.** What is the impact of biotechnology on agricultural and other related fields?



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**13.** Give five examples each of the fruiting and flowering plants developed through tissue culture and mention their benefits.



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**14.** Collect information about various hybrid varieties of animals. What are their benefits? Make a presentation of various pictures and videos.



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**15.** What will happen if transgenic potatoes are cooked for consumption?



**Watch Video Solution**

**16.** Collect more information about the Human Genome Project, one of the important projects in the world.



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**17.** Which new species of rice have been developed in India?



**Watch Video Solution**

**18.** Collect the information and make the chart about the work of various state and national level institutes related with biotechnology.



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**19.** Why people from all over the world are again preferring the local wild varieties?



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**20.** Bring a packet of 'Balguti' from ayurveda shop. Learn the information about each component of it. Collect information about various other medicines and prepare the chart as shown below.



**View Text Solution**

**21.** Which fruit processing industries you observe in your surrounding? What is their effect?



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**22.** Visit the organic manuring projects nearby your place and collect more information



**Watch Video Solution**

23. What will you do to increase public awareness about organ donation in your area?



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24. Collect information about 'green corridor' .  
Make a news-collection about it.



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25. \_\_\_\_\_ is related with the synthesis of insulin.



A. Anaemia

B. phenylketonuria

C. haemophilia

D. Diabetes

**Answer:**



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**26.** Which of the following is NOT a source of organic manure?

A. Oil cakes

B. Vermiculture

C. Compost

D. Malathion

**Answer:**



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**27.** Which of the following organs can be donated when the donor is alive?

A. Lung

B. Skin

C. Eyes

D. Heart

**Answer:**



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**28.** Which protein is used against dwarfism?

A. Interleukin

B. Interferon

C. Somatostatin

D. Factor VIII

**Answer:**



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**29.** Identify the odd one out.

Sunflower, alfalfa, Pseudomonas, Pteris v[ttata



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**30.** Name the technique of absorption or destruction of harmful pollutants with the help of plants and microbes.



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**31.** True or False. If false, write the correct sentence. \White biotechnology refers to the increased production of milk and milk products.



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**32.** Complete the analogy. Somatostatin:

Dwarfism : : Interleukin: ---



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**33.** Give four examples of biotechnological products used for human healthcare.



**Watch Video Solution**

**34.** Write a short note in vaccination.



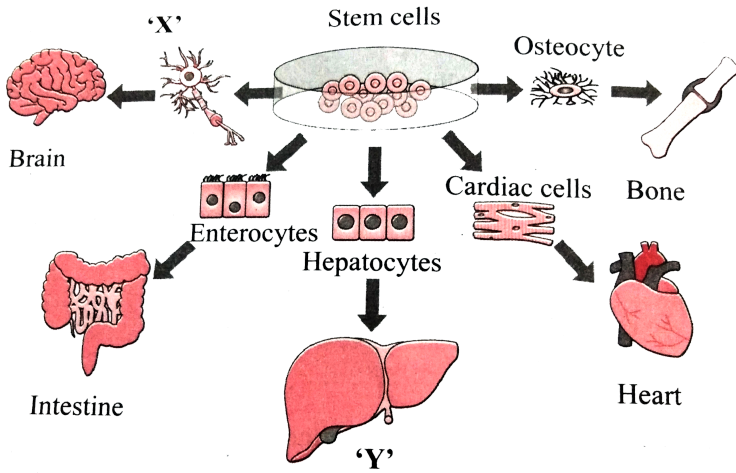
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**35.** Mention any four benefits of crop biotechnology.



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**36.** Observe the diagram and answer the questions given below it.



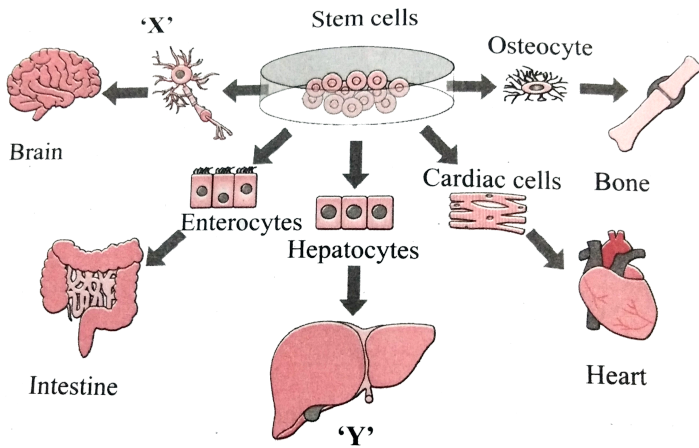
Which property of stem cells is shown in the given diagram?



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37. Observe the diagram and answer the questions given below it.

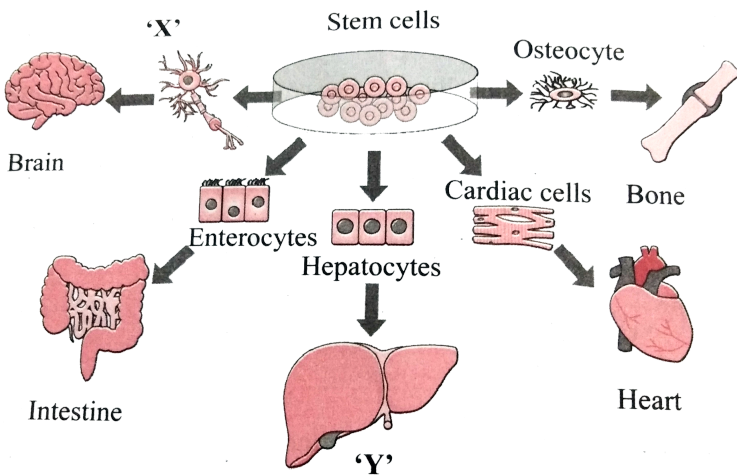




Label the cells/organs marked as 'X' and 'Y' in the given diagram.

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38. Observe the diagram and answer the questions given below it.



What is the use of the culturing tissues/ organs from stem cells?

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39. Explain the concept of genetically modified Bt crops with examples

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**40.** Suggest any three measures to be followed while using pesticides.



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**41.** With the help of a neat labelled diagram explain the process of production of transgenic potatoes as edible vaccines.



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**42.** Explain in detail the different aspects by which biotechnology benefits human life.



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