1. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because -
(a) bacteria are resistant to the toxin
(b) toxin is immature;
(c) toxin is inactive;
(d) bacteria encloses toxin in a special sac.
Ans: (c) Toxin is inactive.

2. What are transgenic bacteria? Illustrate using any one example.
Ans: Bacteria carrying foreign gene are called transgenic bacteria. For example, two DNA sequences (A and B chains of human insulin) were introduced into the plasmid ofbacteria E.coli. The leansgenic bacteria start producing insulin chains.

3. Compare and contrast the advantages and disadvantages of production of genetically modified crops.
Ans:

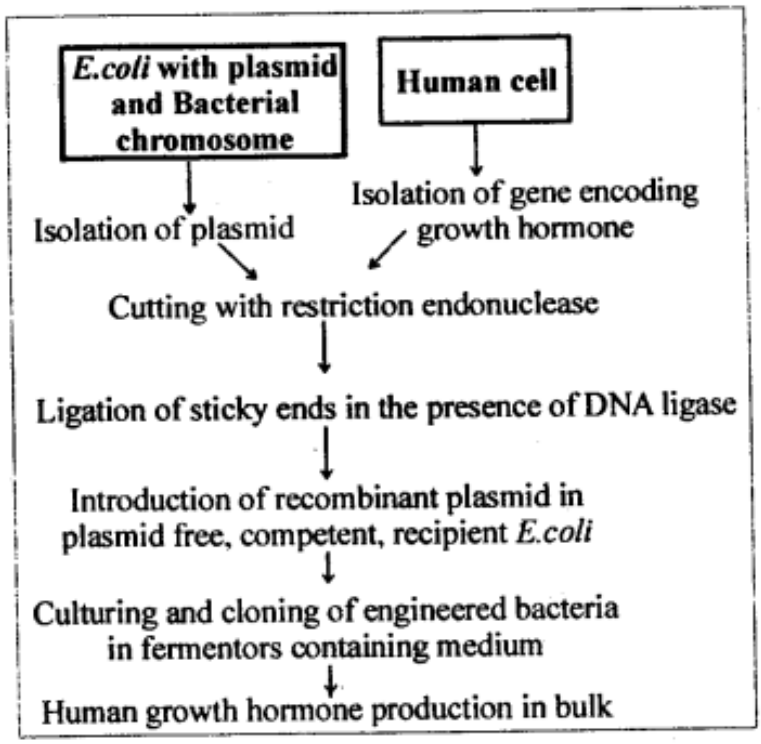
	Advantages of GM	Disadvantages of GM
1	Replenishment of soil.	Danger of generating superweeds.
2	Tolerance to stress	Introduction of undesirab' variety with harmful combination.
3	Great productivity	High danger of non-reproduction / inviability.
4	Less reliances on pesticides.	Chemical produced may cause rejection in human insecticide.

4. What are Cry proteins? Name an organism that produce it. How has man exploited this protein to his benefit?
Ans: Cry proteins are protein responsible for killing lepidopteran insect and their larvae (also called Bt toxin). It is secreted by Bacillus thuringienesis. Man exploited gene encoding this toxin, by transferring it into cotton genome with the help of Agrobacterium TDN A as vector.

5. What is gene therapy? Illustrate using the example of adenosine deaminase (ADA) deficiency.
Ans: Gene therapy is correction of malfunctioning / gene by repairing or adding correct copy. ADA (adenosine deaminase deficiency) is a very rare genetic disorder due to deletion of the gene for adenosine deaminase. The enzyme is crucial for the immune system to functions. It can be treated by gene therapy. This

gene is transfected into early embryonic cells of bone marrow for permanent use.

6. Digrammatically represent the experimental steps in cloning and expressing an human gene (say the gene for growth hormone) into a bacterium like E. coli ?
Ans:



7. Can you suggest a method to remove oil (hydrocarbon) from seeds based on your understanding of rDNA technology and chemistry of oil?
Ans: The genes for the formation of oil in the seed should be identified. The appropriate genes should be removed with the help of restriction endonucleases. Such DNA should then be treated with DNA ligases to make seal DNA at the broken ends. These cells when grown aseptically on nutrient medium will differentiate into a new plant whose seeds will not have oil in them.

8. Find out from internet what is golden rice.
Ans: Golden rice is transgenic rice having gene coding for vitamin A synthesis enzyme. Golden rice was developed by Swiss Federal Institute of Technology, rich in vitamin A (beta carotene). The rice grains are golden yellow in colour due to colour it gets from the beta carotene.

9. Does our blood have proteases and nucleases?
Ans: No, blood does not have protease and nuclease.If it would have been there blood and cell would have been digested, some protease do exist in inactive form.

10. Consult internet andflnd out howto makeorally activ&protein pharmaceutical. What is the major problem to be encountered?
Ans: Orally active protein product that is successfully manufactured is vaccines for preventions of infectious diseases such as hepatitis B, herpes, influenza, etc. Gene for antigen are isolated from bacteria and grown along with cut leaf portions of potato plant in antibiotic medium - followed by callus formation and recombinant/transgenic potato are obtained which contain those vaccines.

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