

1. Genetically Modified Organisms (GMO) is always a debatable topic among scientists, academicians and public. State any 4 usefulness of GMO. (2)(Model 2017, March 2015)

### APPLICATION IN AGRICULTURE

2. Genetically modified plants have been used in many ways. Give any 4 advantages of such plants. (2)(March 2018)

3. Biotechnology in agriculture will lead to pest resistant plants, which could decrease the amount of pesticides used. For example Bt cotton. Expand the letter 'B' and 't'. (1) (March 2015, 2014)

4. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because –

- bacteria are resistant to the toxin
- toxin is immature;
- toxin is inactive;
- bacteria encloses toxin in a special sac. (NCERT)

5. Bt toxin is produced by *Bacillus thuringiensis* that can kill certain insects.

- Name the bacterial gene that is producing this toxin.
- Why the toxin produced by the bacterium is non toxic to itself? (2) (March 2011)

6. Observe the relation in the first pair and fill up the blank in the second.

Cry I Ac : Controls cotton bollworm  
 ..... : Controls corn borer (Say 2011)

7. Using genetically modified crops, farmers can minimize use of insecticides and pesticides during cultivation.

- Give name of one such genetically modified pest resistant crop.
- Which gene is used for its production?
- Name the source of pest resistant gene.
- Write about its mode of action. (2) (SAY 2012, March 2011)

8. *Meloidogyne incognita* is a nematode parasite infects the roots of tobacco plants. Its infection can be prevented by biotechnological method.

- Name the strategy.
- Explain the principle behind the strategy. (2)(March 2018)

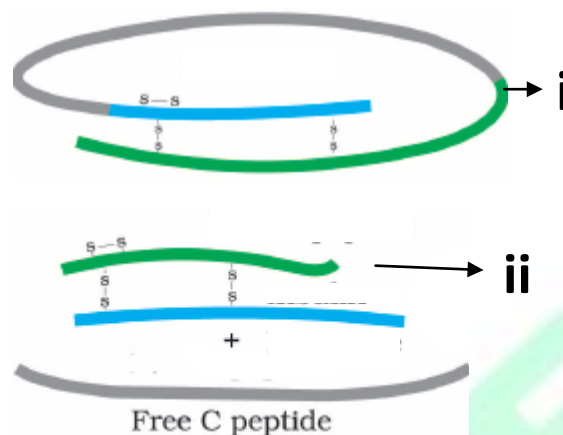
9. RNAi was first introduced in tobacco plants to restrict the infection of a nematode worm .....

10. A novel strategy to prevent nematode infestation is based on 'RNA interference'.

- Explain RNA interference.
- Can you suggest, how it can be used for producing nematode resistant plant. (2) (Model 2019, March 2013, 2012, 2010)

### APPLICATION IN MEDICINE

11.



Observe the above figures.

- Identify i and ii
- Distinguish i and ii. (2)(Model 2018)

12. Insulin getting assembled into a mature form was the major challenge in commercial insulin production by rDNA technology. How did Eli Lilly Company found solution to this problem?

(2) (March 2018, 2017, 2016)

13. Nita found that her Grandma used to inject human insulin that is genetically engineered. She wants to know how such insulin can be produced. Give her an idea about structure of insulin and the production of genetically engineered insulin.

(2) (SAY 2014, 2012, March 2011, 2010)

14. The first clinical gene therapy was given to a 4 year old girl child.

- What was her genetic disorder?
- Briefly describe the clinical procedure adopted in this case. (2)(Model 2018)

15. Sophia was born with genetic disorder- ADA deficiency.

- What is ADA deficiency?
- Can you suggest methods to treat this ADA deficiency? (2) (March & SAY 2013, March 2012, SAY 2010)

16. Early detection of disease can be possible by molecular diagnosis.

- Name any 2 methods used for molecular diagnosis
- Describe the role of autoradiography in molecular diagnosis. (2) (Model 2014)

17. PCR technique is used for the proper diagnosis and early detection of the disease.

- Expand PCR
- Explain the role of PCR technique in the early detection. (3) (Model 2017)

### TRANSGENIC ANIMALS

18. Name the first transgenic cow. Name the protein contained in the milk of this cow. (1)(Model 2018)

19. Animals that have their DNA manipulated to possess and express foreign DNA are called transgenic animals. Write briefly any 3 benefits of such animals to human beings.

(3) (Model 2019, March 2014)

20. Match the following.

- |                                |                    |
|--------------------------------|--------------------|
| (a) Antigen- antibody reaction | (i) ADA deficiency |
| (b) $\alpha$ - lactalbumin     | (ii) Emphysema     |
| (c) $\alpha$ -1-antitrypsin    | (iii) Rosie        |
| (d) Gene therapy               | (iv) ELISA         |

(2) (March 2017)

## ETHICAL ISSUES

**21. You have developed a GM plant.**

- Which governmental organisation will you approach to obtain clearance for its mass production?
- Is such a body necessary? Give 2 reasons.

**22. Explain the short forms used in Biotechnology.**

- |           |           |
|-----------|-----------|
| i. PCR    | ii. ELISA |
| iii. GEAC | iv. GMO   |
| v. RNAi   | vi. dsRNA |
| vii. Bt   | viii. ADA |

(2) (SAY 2013)

**23. In 1997, an American company got patent rights on Basmati rice through the U.S patent and trademark office. Variety of Basmati has actually been derived from Indian farmer's varieties. If so, what is Biopiracy?**

(1) (March 2016, 2014)

**24. In the 2012 children's science congress, one of the speaker summarized like this-** "If we are not vigilant, countries or individuals encash our resources as their right". Explain this with an example.

(2) (SAY 2014)



**HSSLIVE.IN**