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**Level – 1**

**(Based on In Field of Agriculture)**

1. Biotechnology mainly deals with :
2. Industrial scale production of Biopharmaceutical.
3. Biological use of genetically modified microbes, fungi , plants and animals.
4. Both (a) and (b)
5. None of these
6. The applications of biotechnology includes all except:

|  |  |
| --- | --- |
| a) Waste treatment | b) Energy production |
| c) Genetically modified crops | d) Conventional hybridization |

1. Applications like bioremediation, processed food, therapeutics and diagnostics are related to :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Biochemistry | b) Microbiology | c) Biotechnology | d) Medical science |

1. Which of the following is/are the critical research areas of biotechnology?
2. Providing best catalyst.
3. Creating optimum conditions for catalyst function.
4. Developing down streaming processing technique.
5. All of the above
6. Which of the following is for increasing food production?

|  |  |
| --- | --- |
| a) Agro based agriculture | b) Organic agriculture |
| c) Genetically engineered crop-based agriculture | d) All of the above |

1. Organic agriculture is a technique of raising crops for :

|  |  |
| --- | --- |
| a) Increased food production | b) Reduction in required labour |
| c) Increasing the use of agrochemicals | d) All of the above |

1. Use of genetically modified crops in crop field may :

|  |  |
| --- | --- |
| a) Increased harmful effects of fertilizers | b) Reduced yield |
| c) Be environment friendly | d) all of the above |

1. Plant, animals and fungi whose genes have been altered by manipulation are called :

|  |  |
| --- | --- |
| a) Genetically modified organisms | b) Hybrid organisms |
| c) Pest resistance organisms | d) Insect resistant organisms |

1. Golden rice is a genetically modified crop plant with the incorporated gene is meant for biosynthesis of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Vitamin – B | b) Vitamin – C | c) Vitamin – B12 | d) Vitamin – A |

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1. Consumption of which one of the following foods can prevent the kind of blindness associated with Vitamin – A deficiency?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Flavr savr tomato | b) Canolla | c) Golden rice | d) Bt brinjal |

1. Which toxin is produced by Bacillus thuringiensis?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Bt toxin | b) An acid | c) t-toxin | d) none of these |

1. The bacterium, Bacillus thuringiensis is widely used in contemporary biology as an alternative of :

|  |  |
| --- | --- |
| a) Insecticides. | b) Agent for the production of diary products. |
| c) Source of industrial enzymes | d) Indicator of water pollution |

1. Which bacterium was the first to be used as biopesticide on the commercial scale in the world>

|  |  |  |  |
| --- | --- | --- | --- |
| a) Bacillus thuringiensis | b) Escherichia coli | c) Pseudomonas | d) Agrobacterium |

1. GM crops are designed to developed natural resistance from insects and pests. Which of the following crops are modified using bacillus thuringiensis?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Corn & Cotton | b) Tomato & rice | c) Potato & Soyabean | d) All of the above |

1. Which of the following BT crops is being grown in India by farmers?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Maize | b) Cotton | c) Brinjal | d) Soyabean |

1. Insect resistance transgenic cotton has been produced by inserting a piece of DNA from:

|  |  |  |  |
| --- | --- | --- | --- |
| a) An insect | b) A bacterium | c) A wild relative of cotton | d) A virus |

1. Some strains of Bt produces proteins that kill insect like:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Lepidopterans | b) Coleopterans | c) Dipterans | d) All of these |

1. Bt toxin is :

|  |  |
| --- | --- |
| a) Intercellular crystalline protein | b) Extracellular crystalline protein |
| c) Intercellular monosaccharide | d) Extracellular polysaccharide |

1. Bt forms crystal protein which contains:

|  |  |
| --- | --- |
| a) toxic insecticidal protein | b) non- toxic insecticidal protein |
| c) Simple proteins | d) Simple lipids |

1. Bt toxin protein crystals present in bacterium bacillus thuringiensis , do not kill the bacteria because :

|  |  |
| --- | --- |
| a) Bacteria are resistance to the toxic | b) Bacteria enclose toxic in special sac |
| c) Toxin occur as inactive protoxins in bacteria | d) None of the above |

1. Bt toxin kills insects by :
2. Inhibiting the protein synthesis.
3. Generating excessive heat.
4. Creating pores in the midgut epithelial cells, leading to cell swelling and lysis.
5. Obstructing a biosynthetic pathway.
6. The Bt toxin protein :

|  |  |
| --- | --- |
| a) Increases in protein content | b) Causes death of the insects ingesting it |
| c) Stops egg laying of adults | d) Generative excess heat |

1. The choice of gene of bacillus thuringiensis which is to be incorporated into depends upon :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Crop | b) Targeted pest | c) toxin | d) Both (a) and (b) |

1. The crops having cry genes need:

|  |  |
| --- | --- |
| a) no insecticide | b) Small amount of insecticide |
| c) Large amount of insecticide | d) None of the above |

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1. cry II Ab and cry I Ac produces toxin that control:

|  |  |
| --- | --- |
| a) Cotton bollworms and corn borer. | b) Corn borer only |
| c) Cotton bollworms only | d) Nematode and tobacco ball worms |

1. Bt corn has been made resistant to corn borer by the introduction of gene :

|  |  |  |  |
| --- | --- | --- | --- |
| a) cry I Ac | b) cry II Ab | c) cry I Ab | d) cry II Ac |

1. cry II Ab and cry I Ab produces toxin that control:

|  |  |
| --- | --- |
| a) Cotton bollworms and corn borer respectively | b) Corn borer only |
| c) Tobacco bollworms and nematode respectively | d) Nematode and tobacco ball worms respectively |

1. Which of the following nematode infects the root of tobacco plants which reduces the production of tobacco?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Wuchereria | b) Ascarias | c) Meloidogyne incognita | d) Enterobilus |

1. A novel strategy was adopted to prevent Meloidogyne incognita infection in tobacco plants that was based on the processes of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) DNA interference | b) RNA interference | c) RNA initiation | d) DNA initiation |

1. In which of the following plants, resistance against a nematode was introduced by implying RNAi?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Tomato | b) Bt cotton | c) Tobacco | d) Golden Rice |

1. RNAi stands for :

|  |  |  |  |
| --- | --- | --- | --- |
| a) RNA interference | b) RNA interferon | c) RNA inactivation | d) RNA initiation |

1. RNAi takes place in all eukaryotic organisms as a method of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Insect resistant | b) Cellular defense | c) Translation | d) None of these |

1. Silencing of an unwanted gene could be achieved by the use of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) RNAi | b) DNA polymerase | c) Restriction enzymes | d) None of these |

1. Silencing of mRNA molecule in order to control the production of a harmful protein has been used in the protection of plants from:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Bettles | b) Armyworm | c) Budworm | d) Nematodes |

1. Transposons are also known as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Silenced gene | b) Mobile genetic element | c) Pleiotropic gene | d) Both (a) and (b) |

1. Tobacco plant resistant to nematode have been developed by the introduction of DNA, which is produced :

|  |  |
| --- | --- |
| a) An antifeedant | b) Both sense and antisense RNAs |
| c) A particular hormone | d) Toxic protein |

1. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because :

|  |  |
| --- | --- |
| a) Bacteria are resistant to toxin. | b) Toxin is immature. |
| c) Toxin is inactive | d) Bacteria enclose toxin in special case. |

1. Pathophysiology is the :

|  |  |
| --- | --- |
| a) Study of physiology of pathogen | b) Study of normal physiology of host |
| c) Study of altered physiology of host | d) None of these |

1. Choose the correct option regarding retrovirus.

|  |  |
| --- | --- |
| a) A RNA virus that can synthesise DNA infection. | b) A DNA virus that can synthesise RNA infection. |
| c) A ssDNA virus. | d) A dsRNA virus. |

1. Bt cotton is not :

|  |  |
| --- | --- |
| a) A GM plant | b) Insect resistant |
| c) A bacterial gene expressing system | d) Resistant to all pesticide |

BIOTECHNOLOGY AND ITS APPLICATIONS Page No. 3

1. Golden rice is :
2. A variety of rice grown along the yellow river in China.
3. Long stored rice having yellow colour tint.
4. A transgenic rice having gene for – carotene.
5. Wild variety of rice with yellow coloured grains.
6. Which triggers activation of protoxin to active Bt toxin of Bacillus thuringiensis in bollworm?

|  |  |
| --- | --- |
| a) Moist surface of midgut | b) Alkaline pH of gut |
| c) Acidic pH of stomach | d) Body temperature |

1. A protoxin is :

|  |  |
| --- | --- |
| a) A primitive toxin | b) A denatured toxin |
| c) A toxin produced by protozoans | d) An inactive toxin |

1. In RNAi, genes are silencing using :

|  |  |  |  |
| --- | --- | --- | --- |
| a) ssDNA | b) dsDNA | c) dsRNA | d) ssRNA |

1. Silencing of a gene could be achieved through the use of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) RNAi only | b) Antisense RNA only | c) Both (a) and (b) | d) None of the above |

1. Which one of the following is not critical research areas of biotechnology?
2. The improvement of organism, usually a microbe or a pure enzyme by providing best catalyst.
3. The development of optimum conditions through engineering for catalyst to act.
4. The down streaming processing which include separation of desired product , purification of products and formulation with preservatives.
5. The improvement of quality of agrochemicals through chemical engineering.
6. Which of the following statement is true about Green Revolution?

|  |  |
| --- | --- |
| a) It succeeded in tripling the food supply. | b) Used agrochemicals |
| c) Used improved crop varieties | d) All of the above |

1. Choose the correct statement about agrochemicals.
2. These are expensive for farmers.
3. These have harmful effects on environment.
4. Genetically modified crops are less expensive than agrochemicals.
5. Both (a) and (b)
6. Which statement is true about Bt toxin?
7. Bt protein exists an active toxins in the Bacillus.
8. The inactive protoxin gets converted into active form in the insect gut.
9. The Bacillus has antitoxins to combat the effect of Bt toxin.
10. The activated toxin enters the ovaries of the pest to sterilize it and thus prevent its multiplications.
11. Which of the following is true for Golden rice?
12. It is pest resistance, with a gene for Bacillus thuringiensis.
13. It is drought tolerant, developed using Agrobacterium vector.
14. It has yellow grains, because of a gene introduced from a primitive variety of rice.
15. It is vitamin – A enriched, with a gene from daffodil.

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1. Which of the following ways are suitable for increasing food production?
2. The yield of crops can be increased due to use of improved variety of crops and use of agrochemicals.
3. The use of manure, biofertilizers , biopesticides and biocontrol agents to increase crop production.
4. The use of genetically modified crops to increase the crop production.

Select the correct option:

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 and 2 | b) 1 and 3 | c) 2 and 3 | d) all of these |

1. Genetic modification has :
2. Reduced reliance on chemical pesticides.
3. Increase post-harvest losses.
4. Increased efficiency of minerals usage by the plants.
5. Enhanced nutritional value of the food.

Select the correct statements :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 , 2 , 3 and 4 | b) 1 , 2 and 3 | c) 1 , 3 and 4 | d) 3 and 4 |

1. Consider the following statements and select the correct ones:
2. Bt toxin gene has been cloned from the bacteria.
3. Genetic engineering works only on animals and has not yet been successfully used on plants.
4. Strains of bacillus thuringiensis are used in producing bio insecticidal plants.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 and 2 | b) 1 and 3 | c) 2 and 3 | d) 1 , 2 and 3 |

1. Match column I and column II

|  |  |  |
| --- | --- | --- |
| Column I | Column II | |
| A. Lepidopterans | I. Tobacco budworm and armyworm | |
| B. Coleopterans | II. Bettles | |
| C. Dipeterans | III. Flies and mosquitoes | |
| a) A – I ; B – II ; C – III | | | b) A – II ; B – III ; C – I | |
| c) A – III ; B – II ; C – I | | | d) A – I ; B – III ; C – II | |

1. Match column I and column II

|  |  |  |
| --- | --- | --- |
| Column I | Column II | |
| A. Golden Rice | I. Armyworm | |
| B. Bt toxin | II. Rich in Vitamin – A | |
| C. RNAi | III. Cry protein | |
| D. Lepidopterans | IV. Gene silencing | |
| a) A – II ; B – III ; C – IV ; D – I | | | b) A – III ; B – IV ; C – I ; D – II | |
| c) A – IV ; B – I ; C – III ; D – II | | | d) A – II ; B – III ; C – I ; D – IV | |

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**Answers**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. c | 1. d | 1. c | 1. d | 1. d | 1. d | 1. c | 1. a |
| 1. d | 1. c | 1. a | 1. a | 1. a | 1. d | 1. b | 1. b |
| 1. d | 1. a | 1. a | 1. c | 1. c | 1. b | 1. d | 1. a |
| 1. c | 1. c | 1. a | 1. c | 1. b | 1. c | 1. a | 1. b |
| 1. a | 1. d | 1. b | 1. b | 1. c | 1. c | 1. a | 1. d |
| 1. c | 1. b | 1. d | 1. c | 1. c | 1. d | 1. d | 1. d |
| 1. b | 1. d | 1. d | 1. c | 1. b | 1. a | 1. a |  |
|  |  |  |  |  |  |  |  |

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**Level – 2**

**(Based on In Field of Medicines)**

1. jjuith :
2. The control use of biocontrol agents, such as live organisms or enzymes from organisms to produce products and processes for human welfare is called as :Bt

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) | c) | d) |

1. EFB stands for :

|  |  |
| --- | --- |
| a) | b) |
| c) | d) |