



BIOLOGY

BOOKS - MBD -HARYANA BOARD

BIOTECHNOLOGY AND ITS APPLICATIONS

Example

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

because:

bacteria are resistant to the toxin



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2. Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves

because:

Toxin is immature



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

Toxin is inactive



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

bacteria encloses toxin in a special sac.





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5. What are transgenic bacteria? Illustrate using any one example.



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6. Compare and contrast the advantages and disadvantages of production of genetically modified crops.



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7. What are Cry proteins ?Name an organism that produces it.How has man exploited this protein to his benefit?



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8. How is *Bacillus thuringiensis* useful in biocontrol of insect pests?



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9. *Bacillus thuringiensis* has great potential in biocontrol or pest control. Explain.



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10. What is gene therapy? Illustrate using the example of adenosine deaminase (ADA) deficiency.



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11. Can you suggest a method to remove oil (hydrocarbon) from seeds based on your understanding of rDNA technology and chemistry of oil?



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12. Find out from internet what is Golden Rice.



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13. Does our blood have proteases and nucleases?



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14. What is transgenic organism?



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15. Write two applications of biotechnology.



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16. Write scientific name of nematode that attack roots of tobacco plant.



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17. Name the bacterium used as vector to insert gene.



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18. What are probes?



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19. What are transgenic animals?



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20. Name two diseases that can be treated by producing biological compound in transgenic animal.



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21. Name the first transgenic cow.



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22. Which vaccine was being tested on mice?



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23. Expand GMO.



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24. Name the toxin produced by *Bacillus thuringiensis* .



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25. What is the utility of Bt-Toxin gene?



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26. Name the insect killed by Bt-toxin which attack cotton plants.



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27. Bt-toxin protein exist in which form?



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28. How is inactive Bt-toxin converted into active form?



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29. How Bt-toxin causes death of insect?



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30. List the specific insects killed by
Cry I AC



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31. List the specific insects killed by cry II Ab.



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32. Name the insects killed by proteins coded by cry II ab and cry III Bb.



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33. What is unique about transgenic animals?



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34. What is silencing of mRNA ?



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35. What is the source of complementary strand in mRNA silencing?



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36. Name the vector which act as killer of nematode by secreting interferens RNA.



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37. Name the transgenic cow which produces huan protein enriched milk.Give specific contents of milk.



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38. How is INDIAN Basmati unique?



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39. Give an example of crop in which nutritional value is enhanced.



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40. List a few genetically modified plants having Bt-toxin gene.



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41. Name a few forms of cry gene.



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42. Name the genetically engineered insulin.



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43. What is the product of Bt-toxin genes?



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44. Write one use of PCR technique?



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45. At what stage a recombinant DNA is made in meiosis.



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46. Name the insulin produced by genetic engineering?



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47. Name a 'natural genetic engineer' of plants.



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48. What are the applications of biotechnology?



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49. List three critical research areas of biotechnology.



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50. Define Genetically Modified Organisms(GMO).Name two factors on which their behavior depends.



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51. List a few transgenic organisms and their potential application.



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52. Give the few characteristics of GMOs.



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53. What is cry protein?



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54. Enlist different cry genes of *B.thuringiensis* and their target insects.



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55. How is transgenic tobacco plant protected against *Meloidogyne incognita*? Explain the process.



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56. What are advantages of molecular diagnostic over conventional methods?



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57. List two uses of cloned genes in molecular diagnostics.



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58. How is early detection of infectious diseases possible by molecular diagnostics?



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59. How is ELISA test carried out?





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60. Explain structure of Insulin. How insulin is synthesised in human (or mammals)?



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61. Why insulin is being extracted from bacteria rather than animal source?



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62. What is a gene library ?



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63. Why is the use of probes considered better than conventional diagnostic tools for disease diagnosis?



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64. What is reporter or marker gene?



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65. Name three different marker genes used in gene transfer in animal cells.



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66. Name different transfection methods.



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67. Why mice are considered most suitable animal for transgenic production?



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68. What is the PCR ?Write its advantages.



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69. Explain the social ,economical and environmental implications of genetic

engineering techniques.



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70. Name a few useful products obtained from animal cell lines.



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71. What are the ethical concerns of biotechnology?



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72. Write a note on bioethics.



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73. Describe the responsibility of GEAC set up by the Indian Government.



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74. Write a short note on:

Production of human growth hormone by E.coli.



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75. Write a short note on:

Animals as organ donors for humans.



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76. Write a short note on:

Plant Variety Protection and Farmer's Right Act.



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77. Explain the following terms in one or two sentences: intellectual property rights, humulin and biofortified foods.



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78. Write a note on Bt Cotton.



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79. Briefly explain why are Transgenic animals produced?



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80. Define probes.



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81. Show the steps involved in gene transfer for the production of human insulin.



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82. Explain the following terms in not more than 70 words.

Biopatent



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83. Explain the following terms in not more than 70 words.

Bioethics



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84. Explain the following terms in not more than 70 words.

Biopiracy.



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85. Show the application of recombinant DNA products.



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86. Make a list of genetically engineered microbes and their applications.



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87. Describe hazards of transgenic animals.



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88. Why E.Coli is used as competent host in rDNA technology?



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89. Describe the enzymes involved in recombinant DNA technology.



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90. What are the advantages of edible vaccines?



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91. What are transgenic animals? How are they useful to mankind?



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92. How transgenic animals are helpful in the study of human diseases?



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93. Why Bt toxin gene does not kill Bacillus bacteria in which it is found ?



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94. What do you mean by 'Golden Rice'?



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Exercise

1. toxin is produced by bacterium *Bacillus thuringiensis*.



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2. Fill in the blanks with suitable words:

In GM plants, genetic modifications enhances

..... value of food.



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3. Fill in the blanks with suitable words:

A nematode incognitia infects roots of tobacco plants and cause a great reduction in yields.



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4. Fill in the blanks with suitable words:

At present about 30 recombinant have been approved for human use the world over.



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5. In insulin chain A and chain B are linked together by bridges.



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6. therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in child/ embryo.



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7. State true or false:

Recombinant DNA technology has made possible to engineer microbes, plant and animals such that they have novel capabilities.



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8. State true or false:

Gene therapy is the extraction of genes into an individual's cells and tissues to treat diseases especially hereditary diseases.



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9. State true or false:

Human insulin is made in yeast cells, yet its structure is absolutely identical to that of natural molecule.



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10. State true or false:

Today, transgenic models exist for many human diseases such as cancer, cystic fibrosis, rheumatoid arthritis and Alzheimer's disease.



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11. Cloned genes are used as probes to detect the presence of its complementary DNA strand

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12. State true or false:

Insulin consists of three short polypeptide chains i.e. chain A, chain B and chain C.

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13. Coin one word for the following statements:

Enzyme linked immunosorbent Assay .



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14. Coin one word for the following statements:

Standards followed to regulate the activities linked with biological activation.



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15. Coin one word for the following statements:

Small nucleotide sequences used to detect the presence of complementary sequence in nucleic acid sample.



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16. Coin one word for the following statements:

A graft between organisms of different species.



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17. Coin one word for the following statements:

Procedure of producing a clone of genetically similar cells.



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18. Coin one word for the following statements:

Theft or robbery of biological resources of a country is called.



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19. Biopiracy is related to which of the following?

A. Traditional knowledge

B. Biomolecules are regarding bioresources

genes isolated from bioresources

C. Bioresources

D. All of the above.

Answer:



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20. Which of the following risks are associated with genetically modified food?

Toxicity

Allergic reaction

Antibiotic resistance in microorganisms
present in alimentary canal

A. I and II

B. I,II and III

C. I and III

D. II and III.

Answer:



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21. A transgene expression can achieve which of the following?

- A. Prevent expression of a native gene
- B. Modify an existing biosynthetic pathway
- C. Produce a protein that itself produces the phenotype of interest or is the product of interest
- D. All of the above.

Answer:



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22. What is gene bank?

A. They are laboratories where DNA of diverse plants are isolated and stored

B. An institution where seeds or vegetative parts of endangered species are preserved in a viable condition for future use

C. It is a garden where a variety of plants
are grown

D. Natural reserve.

Answer:



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23. How are seeds stored in a gene bank?

A. Seeds are dried and stored at room
temperature

B. Seeds treated with fungicides and pesticides and protected from rodents

C. Moisture content is reduced to 5% and stored at a temperature ranging from $10 - 20^{\circ}C$.

D. None of the above.

Answer:



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24. What are transgenic plants?

A. Plants which are pure breeding

B. Plants containing specially introduced genes and hence showing tolerance to select herbicides

C. A crop plant which is not destroyed by herbicides

D. A plant resistant to insect pests.

Answer:



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25. At crypreservation of germplasm the biological activity:

- A. Essentially ceases
- B. Cell division stops
- C. No genetic change occurs
- D. All of the above.

Answer:



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26. The Ti plasmid, is often used for making transgenic plants. This plasmid is found in

A. Rhizobium of the roots of leguminous plants

B. Agrobacterium

C. Yeast as a 2 mm plasmid

D. Azotobacter.

Answer:

27. In transgenics, expression of transgene in target tissue is determined by :

- A. transgene
- B. promoter
- C. reporter
- D. enhancer.

Answer:

28. ELISA is used to detect viruses, where.

A. Southern blotting is done

B. alkaline phosphatase is the key reagent

C. catalase is the key reagent

D. DNA-probes are required.

Answer:



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