



BIOLOGY

BOOKS - ARIHANT PUBLICATION

APPLICATIONS OF BIOTECHNOLOGY

Part I Question For Practice Very Short Answer Type Questions

1. A biotech company that released first even genetically manipulated flower into the market

is

A. Cryobank

B. Eli Lilly

C. Florigene

D. Genentech

Answer: C



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2. Which of the following is produced by genetical engineered bacteria ?

A. Thyroxine

B. Insulin

C. Glucagon

D. ADH

Answer: B



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3. Cry II Ab and Cry I Ab produce toxins that control

A. cotton bollworms and corn borer,
respectively

B. corn borer and cotton bollworms,
respectively

C. tobacco budworms and nematodes,
respectively

D. nematodes and tobacco budworms,
respectively

Answer: A



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4. First genetically modified plant commercially released in India is ---.

A. golden rice

B. slow ripening tomatoes

C. Bt-brinjal

D. Bt-cotton

Answer: D



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5. Correct the statement, if required, by changing the underlined word

An amorphous mass of parenchyma cells developed by tissue culture is called embryo.



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6. Correct the statement, if required, by changing the underlined word

Petunia is ice minus strain which when sprayed on crops prevents frost formation.



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7. Correct the statement, if required, by changing the underlined word

The natural source of vitamin-E is α -tocopherol.





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8. Correct the statement, if required, by changing the underlined word

The first GMO was created by Watson.



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9. Define callus.



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10. Name one plant used to create novel transgenic plants.



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11. Name the drugs isolated from *Catharanthus roseus* for cancer treatment.



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12.is a mammalian protein that have been successfully expressed in plants.



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13. Nitrogenase is encoded by genes in nitrogen-fixation plants.



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14. Primarily, insulin is synthesised as.....



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15. SCID is caused due to a failure of synthesis of an enzyme_____.



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Part I Question For Practice Short Answer Type I Questions

1. What is golden rice?



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2. Can a disease be detected before its symptoms appear? Explain the principle involved.



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3. How recombinant DNA technology is useful in detecting the presence of mutated genes?



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4. Why is the functional insulin produced, considered better than the ones used earlier by diabetic patients?



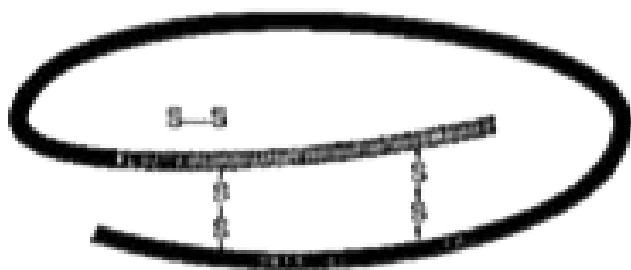
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5. How is a mature, functional insulin hormone different from its prohormone forms?



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6. Refer to the diagram given below and answer the questions that follows

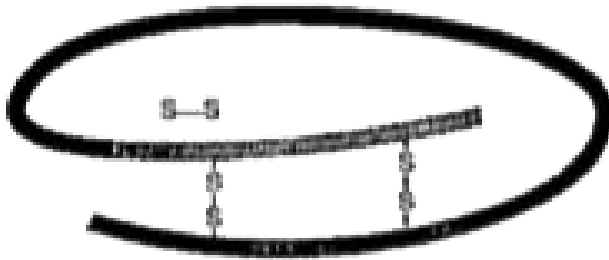


The diagram shown above is insulin or proinsulin? Justify.



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7. Refer to the diagram given below and answer the questions that follows



How is mature insulin synthesised?



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8. How did an American Company, Eli Lilly use the knowledge of rDNA technology to produce

human insulin?



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9. How did Eli Lilly synthesise the human insulin? Mention one difference between this insulin and the one produced by the human pancreas.



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10. How did Eli Lilly Company go about preparing the human insulin? How is the insulin thus produced different from that produced by the functional human insulin gene?



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11. Recombinant DNA technology is of great importance in the field of medicine. With the help of a flow chart, show how this technology

has been used in preparing genetically engineered human insulins.



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12. Write the function of adenosine deaminase enzyme. State the cause of ADA deficiency in humans. Mention a possible permanent cure for an ADA deficiency patient.



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13. What is gene therapy? Name the first clinical case in which it was used.



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



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15. Write a short note on transgenic plants.



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16. Write notes with 2 to 3 important points

Bacillus thuringiensis



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17. Why do the toxic insecticide proteins secreted by *Bacillus thuringiensis* kill insects?



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18. Why does Bt toxin cannot kill the bacterium that produces it, but kills the insect that ingests it?



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19. Bt cotton is resistant to pests, such as lepidopterans, dipterans and coleopterans. Is Bt cotton resistant to other pests as well?





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20. Why certain cotton plants are called Bt cotton?



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21. Differentiate the terms 'Cry' and 'cry'.



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



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23. Name the source and type of cry genes used for incorporation into crops by biotechnologists. Explain, how have these genes brought beneficial changes in the genetically modified crops.





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24. Expand GMO. How is it different from a hybrid?



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25. Describe any three potential applications of genetically modified plants.



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Part I Question For Assessment Very Short Answer Type Questions

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 enclose toxin in a special sac

Answer: C



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2. Soil bacterium Nitrosomonas syringae
promotes ice nucleation in plants.



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3. Correct the statement, if required, by
changing the underlined word(s)

The C-peptide is added during the maturation of pro-insulin to insulin.



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4. Correct the statement, if required, by changing the underlined word(s)

ADA treatment uses monocytes.



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5. Choose the correct answer from the choices given under each bit/Give the answer in one word only :

Which organism is used as the cloning host cell to produce humulin ?



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6. State the number of polypeptides found in mature human insulin.



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7. What do you mean by the term transgene?



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8. Where the LDL receptors are present?



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9. is the precursor of vitamin-A.



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10. infects the roots of tobacco plants.



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Part I Question For Assessment Short Answer Type Questions

1. How is gene-splicing done?



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2. How many recombinant therapeutics have been approved for human use the world over ?



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3. Why is insulin extracted from animal models elicit an immune response in a diabetic patient?



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4. Mention the steps involved in insulin production.



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5. What are the different forms of cry genes?



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6. Write down the ways to minimise the use of fertilisers and chemicals so that their harmful

effects on the environment are reduced.



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Part II Question For Practice Very Short Answer Type Questions

1. Basic principle of developing transgenic plants and animals is to introduce the gene of interest into the nucleus of _____.

A. somatic cell

B. vegetative cell

C. germ cell

D. body cell

Answer: C



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2. Which among the following pharmaceutical products is harvested by using transgenic animals as bioreactors?

A. Urokinase

B. Insulin

C. Lactoferrin

D. All of these

Answer: D



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3. The superbug can be used in

A. oil spills

B. water pollution

C. eutrophication

D. air pollution

Answer: A



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4. Biopatents are usually awarded for the discovery of

A. new cell lines

B. new DNA sequences

C. GM strains

D. All of these

Answer: D



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5. Exploitation of patent biological resources of a country by another country is known as?

A. biopatent

B. biopiracy

C. biowar

D. All of these

Answer: B



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6. Antitrypsin is an agent that dissolves blood clot.



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7. The first transgenic sheep was Lilly.



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8. Correct the statement, if required, by changing the underlined word

A Pacific transgenic whale was generated by a growth hormone transgene.



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9. Name the institute that came up with a cloned sheep, named Dolly.



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10. Which bacterium species is involved in Diamond V. Chakrabarty case?



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11. is a transgenic sheep.



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12.is an infant nutrition formula that has been harvested using transgenic animals as bioreactors.



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13. In 1990,..... the transgenic ewe was born in Scotland.



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Part Ii Question For Practice Short Answer Type Questions

1. What is meant by transgenic animal ?



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2. Comment on how transgenic animals have proved to be beneficial in Production of biological products?



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3. Comment on how transgenic animals have proved to be beneficial in Chemical safety testing?



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4. What is the utility of transgenic animals ?



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5. With respect to understanding diseases, discuss the importance of transgenic animal models.



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6. Which animals are being used for testing the safety of vaccines?



Watch Video Solution

7. Name the first transgenic cow. Why is it important?



Watch Video Solution

8. Explain alpha lactalbumin. Where is it produced in human body?



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9. In what manner biotechnology has helped in production of more nutritionally balanced milk?



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10. While creating genetically modified organisms, genetic barriers are not respected. How can this be dangerous in the long run?



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11. State why biopiracy should be prevented and how?



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12. State the initiative taken by the Indian Parliament against biopiracy.



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13. Write notes on: Biopatent





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14. Name a set of principles that may be used to regulate human activities in relation to the biological world. Why are they important?



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15. What is mean by 'biopiracy'?



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Part II Question For Assessment Very Short Answer Type Questions

1. Which one of the following known as 'Superbug'?



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2. US Patent on turmeric was challenged by



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3. Biopiracy.

- A. the use of biological patent
- B. thefts of plants and animals
- C. the use of bioresources of a country
without proper authorisation
- D. stealing of biological resources

Answer: C



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4. Correct the statement, if required, by changing the underlined word(s)

Transgenic mouse is smaller than the normal mouse.



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5. Correct the statement, if required, by changing the underlined word(s)

Human protein α -2-trypsin is used to treat emphysema.



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6. What are transgenic animals?



Watch Video Solution

7. Name the first transgenic cow that produced human protein enriched milk.



Watch Video Solution

8. Name a transgenic animal being used in testing the safety of polio vaccine.



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9. Mention the name of two common diseases that can be treated by medicines that contain biological products of transgenic animals.



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10. What is patent?



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11. Full form of TPA is



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12. Neem patent case was first awarded in favour of



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Part II Question For Assessment Short Answer Type Questions

1. About 95% of all existing transgenic animals are mice. Why in your opinion mice are considered most suitable animal models for biotechnological studies?



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2. Write the full forms of the following

LPA



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3. Write the full forms of the following

PKU



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4. Write about the amendment passed by the Indian Parliament regarding patent issues.



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5. Sumit somewhere heard about biopiracy. To know more about this, he discussed it with his uncle who was a professor of intellectual property rights. Uncle told him that it is the use of bioresources by multinational companies and other organisations without

proper authorisation from the countries and people concerned and without any monetary or social advantage to the source country.

Name the plants (atleast two) on which such controversies occurred in India.



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use of bioresources by multinational companies and other organisations without proper authorisation from the countries and people concerned and without any monetary or social advantage to the source country.

Why is biopiracy considered unethical?



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Explain bioethics with reference to genetic engineering.



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Part II Question For Assessment Differentiate Between The Following

1. Herbicide resistant plants and Frost resistant plants.



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2. Humulin and Wosulin.



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3. Differentiate between animal farming and animal cloning.



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Odisha Bureau S Textbook Solutions Very Short Answer Type Questions

1. Golden rice is produced by rice plant having a transgene encoding an enzyme in the biosynthesis pathway of:

A. β -carotene

B. luciferin

C. glyphosate

D. Bt protein

Answer: A



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2. Fruit ripening is delayed by preventing the expression of enzyme :

A. luciferase

B. polygalacturonase

C. nitrogenase

D. adenosine deaminase

Answer: D



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3. Humulin is manufactured by

A. Pfizer

B. Hoechst

C. Eli Lilly

D. Aventis

Answer: C



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4. Genetic correction of inflicted cells is made in vitro and then reimplanted into its natural environment. This therapy is known as :

A. ex vivo gene therapy

B. in vivo therapy

C. in vitro therapy

D. in toto therapy

Answer: A



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5. The first genetic disorder treated by gene replacement therapy is :

- A. Familial Hypercholesterolemia (FH)
- B. Cystic Fibrosis (CF)
- C. Duchenne Muscular Dystrophy (DMD)

D. Severe Combined Immunodeficiency
(SCID)

Answer: D



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6. Patent is not granted for:

A. a novel invention

B. an invention having an industrial
application

C. a discovery made by previously existing knowledge

D. an invention having an inventive step

Answer: C



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7. Which of the following is not related to biosafety?

A. Convention on Biological Diversity

B. Cartagena Protocol

C. World Trade Organisation

D. UNICEF

Answer: D



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8. Which of the following patent cases, India is not directly or indirectly connected with ?

A. Soybean patent case

B. Neem patent case

C. Turmeric patent case

D. Chakraborty patent case

Answer: A



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9. Choose the correct answer from the choices given under each bit/Give the answer in one word only:

(c) The supermouse is a genetically modified

animal with

(i) insulin transgene

(ii) lipid biosynthesis transgene

(iii) growth hormone transgene

(iv) steroid hormone transgene

A. insulin transgene

B. lipid biosynthesis transgene

C. growth hormone transgene

D. steroid hormone transgene

Answer: C



10. Which is the nodal centre for Indian biosafety network?

- A. Department of Biotechnology
- B. Department of Science and Technology
- C. Indian Agricultural Research Institute
- D. Department of Forest and Environment

Answer: A



11. The mass of undifferentiated plant cells in a plant tissue culture media is known as



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12. Herbicide resistant plants are generated by plant tissue culture technique by transferringgene of a bacterium into a plant protoplast.



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13. A bacterium species ofgenus is genetically engineered to prevent frost formation in plants.



Watch Video Solution

14. A bioluminescent plant is generated by transferring.....gene of a firefly into plant protoplasts.



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15. Golden rice producing plant is a transgenic plant, whose cells have a transgene encoding..... .



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16. Fill in the blanks

Delayed ripening in tomato is due to the expression of an enzyme_____



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17. Fill in the blank

The first recombinant human vaccine produced and marketed is _____ vaccine.



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18. Humulin is manufactured by



Watch Video Solution

19. Monoclonal antibody is synthesised and secreted by a cell known as



Watch Video Solution

20. Fill up the blank

Severe Combined Immunodeficiency (SCID) is caused due to a failure of synthesis of an enzyme_____



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21. A forensic analysis of DNA for establishing the identity of a person is known as..... .



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22. An immunological technique, applied to detect the presence of very minute quantity of antigen in the serum is known as



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23. A biopesticide, known as Bt protein is expressed by a bacterial species,



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24. A legal right, privilege and authority granted to a person for a limited period for an invention is known as.....



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25. Fill up the blank

The use of novel biological resource of a sovereign country without its due permission is known as _____



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26. The tomato plant variety that bears tomatoes exhibiting delayed ripening.



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27. Which somatic hybrid cell, produces monoclonal bodies?



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28. Fill in the blanks with the correct answer(s): Genetically engineered rice rich in vitamin A is known as ____.



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29. The name of toxic protein produced by *Bacillus thuringiensis* is _____.



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30. Fill up the blank

The _____ is the most widely used broad spectrum herbicide world over.



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31. The biotech company, which commercially manufactured the first recombinant human insulin.



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32. The first genetic disorder treated by gene replacement therapy is :



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33. The gene transfer into the mammalian fertilised egg with a micropipette.



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34. The gene transfer method practiced by passing intermittent pulses of electric current through the medium containing plant protoplasts.



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35. The corn was genetically engineered by transferring Bt protein gene into plant protoplasts. The brand was marketed and later was withdrawn due to safety reasons.





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36. The biosafety protocol that was drafted in 1995 and adopted in 2000. true or false



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Odisha Bureau S Textbook Solutions Short Answer Type Questions

1. What is golden rice?



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2. Answer any three of the following (restrict each answer to two or three important sentences)

What is Flavr Savr tomato?



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3. What does the recombinant hepatitis-B vaccine contain?



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4. What do you understand by ex vivo gene therapy?



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5. What do you mean by a biopesticide? Give an example.



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6. What is a supermouse?



Watch Video Solution

7. Biopiracy.



Watch Video Solution

8. Enumerate and explain in brief two biosafety issues, biotechnology is confronted with



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9. Describe the evolution of Indian Patent Act.



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10. Describe the neem patent case.



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11. Write brief note on the following

Herbicide resistant plants



Watch Video Solution

12. Write brief note on the following

Humulin



Watch Video Solution

13. What is recombinant vaccine?



Watch Video Solution

14. Write brief note on the following

Gene therapy



Watch Video Solution

15. Write brief note on the following

Biopesticide



Watch Video Solution

16. Write brief note on the following

Transgenic animals



Watch Video Solution

17. Write brief note on the following

Patent



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18. Answer the questions (restrict each answer within 200 words).

Write notes on of the following :

Biopiracy



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Chapter Practice Very Short Answer Type Questions

1. A plant expressing a gene from another organisms is

A. transgenic

B. clone

C. transformed

D. somaclonal variant

Answer: A



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2. During the processing of the prohormone 'proinsulin' into the mature 'insulin'

- A. C-peptide is added to proinsulin
- B. C-peptide is removed from proinsulin
- C. B-peptide is added to proinsulin
- D. B-peptide is removed from proinsulin

Answer: B



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3. The Bt toxin is not toxic to human beings because

A. the pro Bt toxin activation requires temperature above human body temperature

B. the Bt toxin recognises only insect-specific targets

C. the Bt toxin formation from pro Bt toxin requires pH lower than that present in human stomach

D. conversion of pro Bt toxin to Bt toxin takes place only in highly alkaline

conditions

Answer: C



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4. Correct the statement, if required, by changing the underlined word(s)

Golden rice is rich in vitamin-B.



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5. Correct the statement, if required, by changing the underlined word(s)

The first clinical gene therapy was given for testing diabetes mellitus.



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6. Correct the statement, if required, by changing the underlined word(s)

Bt brinjal is being grown in India by farmers.



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7. Name the source organism from which Ti plasmid is isolated.



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8. Name the bonds which join two polypeptide chains .A. and .B. in mature insulin.



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9. Which recombinant vaccine is currently being tested at NIH in 2016.



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10. Which of the following techniques is based upon the principle of antigen-antibody interaction ?



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11. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin 'A' deficiency ?



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12. are produced by fusion of B-cells and myeloma cells.



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13. The gene that encodes for- BT protein specific to cotton bollwooni is _____



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Chapter Practice Short Answer Type I Questions

1. Give the full form of ELISA. Which disease can be detected using it? Discuss the principle underlying the test.



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2. Gene and enzyme technologies of Biotechnology are applied in several medical procedures. Explain giving any two examples.



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3. List the advantages of recombinant insulin.



Watch Video Solution

4. What is ADA deficiency ? Mention its cause.

And what are three methods to cure it.



Watch Video Solution

5. What do you mean by a biopesticide? Give an example.



Watch Video Solution

6. Explain at least three areas for which transgenic animals are developed.



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7. How are the developed countries related to biopiracy cases? Explain with an example.



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Chapter Practice Short Answer Type II Questions

1. Differentiate between the following

Somatic cell gene therapy and Germ cell gene therapy.



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2. Differentiate between the following

Biopatent and Biopiracy



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