



BIOLOGY

BOOKS - OSWAAL BIOLOGY (KANNADA ENGLISH)

BIOTECHNOLOGY AND ITS APPLICATIONS

Topic 1 Very Short Answer Type Questions

1. What is gene therapy?



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2. How was the insulin obtained before the advent of rDNA technology? What were the problems encountered?



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





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4. Give the full form of ELISA. Which disease can be detected using it?



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5. Which bacteria produce Bt-toxins?



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6. Bt toxins produced in *Bacillus thuringiensis* is not toxic to it, why?



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7. Name the American company that prepared human insulin.



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8. What are genetically modified crops ?



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9. Write any four pest resistant plants.



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10. Name cry Genes which control the cotton boll worms.



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11. How does the Bt toxin kill the insects in bio-insecticide plants?



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12. Name the bonds Connecting A-chain and B-chain of functional insulin.



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13. Plasmids of which bacteria were used to produced the A-chain and B-chain of insulin separately



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14. What are GMOs? Give two examples.



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15. Name the hormone produced by genetic engineering.



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16. Name the vector used to incorporate the cDNA of ADA into the lymphocytes in gene therapy.



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17. Name the protein produced by *Bacillus thuringiensis*.



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18. Name the inactive form of insecticidal protein.



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19. Write the name of a nematode which infects roots of tobacco plants?



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20. Write any two insect resistant Bt crops.



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21. Name the bacterium which is used to produce insect -resistant plants by genetic

engineering.



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22. Name the technique which is used to detect HIV in suspected AIDS patient?



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23. What is the difference between 'Cry' and 'cry'.



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24. Name any one disease for which gene therapy has been proved effective ?



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25. Name the disorder for which the first clinical gene therapy was conducted.



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26. Name any two techniques that serve the purpose of early diagnosis of some bacteria , viral human diseases.



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27. How many amino acids are arranged in two chains of insulin?



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1. Define gene therapy. Name a genetic disorder that is being treated using the technique of gene 1 therapy.



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2. How is a mature, functional insulin hormone different from its pro-hormone form?



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3. Differentiate between diagnostics and therapeutics. Give one example under each category.



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4. Many proteins are secreted in their inactive form. This is also true of many toxic proteins produced by microorganisms. Explain how the mechanism is useful for the organism producing the toxin?



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5. Insulin extracted from the pancreas of slaughtered cow and pigs cannot be used why?



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6. What are genetically modified organisms ?
Name two factors on which their behaviour depends.



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7. What are the advantages of the techniques of GM crops?



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8. Which three options could be thought for increasing food production ?



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9. Explain why Bt cotton flowers undergo pollination by butterflies and bees inspite of being insect pest resistant?



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10. Name some techniques used for early molecular diagnosis of pathogens and genetic disorders.



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11. Why is the introduction of genetically engineered lymphocytes into ADA deficiency patient not a permanent cure? Suggest a possible permanent cure.



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12. (a) Mention the cause and the body system affected by ADA deficiency in humans.

(b) Name the vector used for transferring ADA-DNA into the recipient cells in humans. Name the recipient cells.



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13. What happens when *Meloidegyne incognitia* consumes cells with RNAi gene?



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14. (a) Tobacco plants are damaged severely when infested with *Meloidegyne incognitia*. Name and explain the strategy that is adopted to stop this infestation.

(b) Name the vector used for introducing the nematode specific gene in tobacco plant.



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15. What are the areas which have been responsible for the recent advances in biotechnology?



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



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17. Bt-cotton is resistant to pest, such as lepidopteron, dipterans and coleopterans. Is Bt-cotton resistant to other pests as well?



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18. Expand the name of the enzyme ADA. Why is this enzyme essential in human body ? Suggest a gene therapy for its deficiency.



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Topic 1 Short Answer Type Questions Ii

1. What is gene therapy ? Explain the steps involved in curing ADA deficiency by gene therapy.



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2. Expand the abbreviation GMO. Write any four used of it.



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3. Write a note on Bt-cotton.



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4. Gene expressions can be controlled with the help of RNA, Explain the method with an example.



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5. ELISA technique is based on the principles of antigen and antibody interaction. Can this technique be used in the molecular diagnosis of a genetic disorder, such as phenylketonuria?



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6. Discuss the advantages of GMO.



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7. Gene therapy is an attempt to correct a genetic defect by providing a normal gene into the individual. By this the normal function can be restored. Alternate method would be to provide the gene product (protein/enzyme) know as enzyme replacement therapy, which would also restore the function. Which in your

opinion is a better option? Give reason for your answer.



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8. What is molecular diagnosis ? Explain .



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9. Write a brief account on genetically engineered insulin.



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10. Plasmid is a boon to biotechnology. Justify this statement quoting the production of human insulin as an example.



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11. Name the source and the types of cry genes isolated from it for incorporation into crops by biotechnologists. Explain how these genes

have brought beneficial changes in the genetically modified crops.



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Topic 1 Long Answer Type Questions

1. Development of Bt cotton has reduced the use of insecticides. Justify. Write a note on gene therapy.



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2. "Genetically modified plants can reduce the use of chemical pesticides" . Justify the statement. Write a note each on B_t toxin and B_t cotton .



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3. One of the applications of biotechnology is the production of insect resistant crop plants." Justify the statement with reference to Bt-cotton.



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4. Describe the steps involved in the synthesis of insulin by recombinant DNA technology.



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5. List the disadvantages of insulin obtained from the pancreas of slaughtered cows and pigs.



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6. Discuss the biotechnological applications in agriculture with special reference to Bt cotton.



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7. Write a brief account on genetically engineered insulin.



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8. Elaborate as to how biotechnology can be helpful in achieving sustainable agriculture.



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9. Give a brief account of the application of biotechnology in therapeutics.



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10. What are genetically modified organisms?

Name two Bt- toxin producing plants



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11. What do you understand by the term bio-pesticide ? Name and explain the mode of action of a popular bio-pesticide.



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1. Name the first transgenic cow. Which gene was introduced in this cow?



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2. For which variety of Indian rice, patent was filed by a USA Company ?



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3. Mention the functions of GEAC (Genetic Engineering Approval Committee).



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4. Which two patents India's biological resources have been revoked ?



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5. Name any two diseases for which transgenic mice are used as model organisms.



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6. Expand GEAC and ELISA.



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7. Which transgenic animal is used for testing the safety of polio vaccine?



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8. What was the speciality of the milk produced by the transgenic cow Rosie?



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9. A multinational company outside India tried to sell new varieties of turmeric without proper patent rights. What is such an act referred to?





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10. Name some future transgenic crops.



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11. Name the Indian variety of rice patented by an American company.



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1. What is GEAC and what are its objectives?



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2. What are transgenic bacteria? Give an example.



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3. How many recombinant therapeutics are been approved for the use of humans?



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4. What are transgenic plants? Give some example.



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5. Why would biopiracy affect India most ?



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6. Write name of the first transgenic crop in India.



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7. Insulin is extracted from which microorganism?



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8. How "Rosie" considered different from a normal cow?



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Topic 2 Short Answer Type Questions li

1. Define b-ansgenic animals. Explain in dct.iil any fow areas where these can be utilized.



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2. What are transgenic organisms? Give examples of some transgenic animals.



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3. Write a note on utility of transgenic crop plants.



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4. What are transgenic animals? How are they obtained? Add a note on their significance.



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5. List the benefits of transgenic animals.



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6. Give a note on variety of Indian rice, patent was filed by a USA Company.



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Topic 2 Long Answer Type Questions

1. Highlight five areas where biotechnology has influenced our lives.



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2. What are transgenic animals? How are they obtained? Add a note on their significance.





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3. What are transgenic organisms? Give examples of some transgenic animals.



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4. Write short notes on :

(a) Biopiracy

(b) Biopatent.



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5. Give a note on ethical issues.



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Topic 2 Multiple Choice Questions

1. Bt-cotton is not :

A. A GM plant.

B. Insect resistant.

C. A bacterial gene expressing system.

D. Resistant to all pesticides.

Answer: D



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2. C-peptide of human insulin is :

A. A part of mature insulin molecule.

B. Responsible for formation of disulphide bridges.

C. Removed during maturation of pro-insulin to insulin.

D. Responsible for its biological activity.

Answer: C



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3. GEAC stands for :

A. Genome Engineering Action Committee.

B. Ground Environment Action Committee.

C. Genetic

Engineering

Approval

Committee.

D. Genetic

and

Environment

Approval

committee.

Answer: C



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4. The alpha-1 antitrypsin is :

A. An antacid.

B. An enzyme.

C. Used to treat arthritis.

D. Used to treat emphysema.

Answer: B



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5. A probe which is a molecule used to locate specific sequences in a mixture of DNA or RNA molecules could be :

- A. A single stranded RNA
- B. A single stranded DNA.
- C. Either RNA or DNA.
- D. Can be ss DNA but not ss RNA.

Answer: A



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6. Choose the correct option regarding
Retrovirus :

- A. An RNA virus that can synthesise DNA during infection.
- B. A DNA virus that can synthesise RNA during infection.
- C. A ssDNA virus
- D. A dsRNA virus.

Answer: B



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7. The site of production of ADA in the body is

A. Bone marrow.

B. Lymphocytes.

C. Blood plasma.

D. Monocytes

Answer: C



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8. A protoxin is :

A. A primitive toxin.

B. A denatured toxin.

C. Toxin produced by protozoa.

D. Inactive toxin.

Answer: B



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9. 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 the above.

Answer: C



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10. The trigger for activation of toxin of *Bacillus thuringiensis* is :

A. Acidic pH of stomach.

B. High temperature.

C. Alkaline pH of gut.

D. Mechanical action in the insect gut.

Answer: C



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11. In RNAi, genes are silenced using :

A. ss DNA.

B. ds DNA.

C. ds RNA.

D. ss RNA.

Answer: C



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12. The first clinical gene therapy was done for the treatment of :

A. AIDS

B. Cancer

C. Cystic fibrosis.

D. SCID (Severe Combined Immuno Deficiency resulting from deficiency of ADA).

Answer: B



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13. ADA is an enzyme which is deficient in a genetic disorder SCID. What is the full form of ADA?

- A. Adenosine deoxyaminase.
- B. Adenosine deaminase.
- C. Aspartate deaminase.
- D. Arginine deaminase.

Answer: B



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14. Silencing of a gene could be achieved through the use of

- A. Short interfering RNA (RNAi).
- B. Antisense RNA.
- C. By both.
- D. None of the above.

Answer: B



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