Chapter 11

BIOTECHNOLOGY AND ITS APPLICATIONS

ONE MARK QUESTIONS:

- 1. Expand GMO. (K)
- 2. How the use of harmful effects of fertilizer and chemicals can be reduced by using biotechnological applications? (A)
- 3. What is gene therapy? (K)
- 4. What does 'Bt' represent in Bt cotton? (K)
- 5. Even though Bt toxin can kill many insects, it will not kill the bacteria that produces it. Why? (A)
- 6. Even though Bt toxin is inactive, it kills the insect when enters its midgut. Why? (A)
- 7. Mention a gene that produces insecticidal protein in Bt cotton. (K)
- 8. Why is the gene encoding 'cry' protein inserted into a crop plants? (A)
- 9. Define RNA interference. (K)
- 10. What are transposons? (K)
- 11. Which biotechnological technique is used to avoid *Meloidogyne incognitia* infestation in tobacco plant? (K)
- 12. Name the nematode which infects the roots of tobacco plant and reduces the yield. (K)
- 13. Why the translation of mRNA is prevented in RNA interference process? (A)
- 14. Why is it advisable to use insulin obtained through genetic engineering rather than insulin obtained from an animal source? (A)
- 15. Name the disease which can be treated by clinical gene therapy. (K)
- 16. Expand ADA. (K)
- 17. Which method is a permanent cure for ADA deficiency disorder? (U)
- 18. Expand ELISA. (K)
- 19. Mention the principle on which ELISA is based. (U)
- 20. Which method of disease diagnosis is used to detect HIV in suspected AIDS patients? (K)
- 21. Define biopiracy? (K)
- 22. Mention an Indian traditional herbal medicine on which biopiracy attempts were made. (K)
- 23. What are transgenic animals? (K)
- 24. Name the first transgenic cow? (K)
- 25. Name the human protein produced by genetically modified animal which is used to treat emphysema? (K)
- 26. What is the special feature of milk produced by the transgenic cow, Rosie? (K)
- 27. A multinational company outside India tried to sell new varieties of turmeric without proper patent rights. What is such an act referred to as? (A)

TWO MARKS QUESTIONS:

- 1. Mention any four benefits of genetically modified organisms. (K)
- Mention two genes that are responsible for producing Cry protein to control cotton bollworms. (K)
- 3. How does inactive protoxin of Bt toxin kills the insect once it is ingested? (U)
- 4. Which animals were the sources of insulin before the genetically engineered insulin was produced? Why this insulin was replaced by genetically engineered insulin. (U)

- 5. Define gene therapy. Mention a disease which has been treated using this technique.
- 6. Why is the introduction of genetically engineered lymphocytes into a ADA deficiency patient not a permanent cure? Suggest a possible permanent cure.
- 7. Mention any two modern methods of disease diagnosis. (K)
- 8. Mention two applications of Polymer Chain Reaction as a molecular diagnostic tool.
- 9. ELISA is one of the methods of molecular diagnosis. What is the principle of this technique and how does it help in detecting HIV infection ?
- 10. What are transgenic animals? Give any two examples. (K)
- 11. What is the role of Genetic Engineering Approval committee (GEAC)? (U)
- 12. Explain any two benefits of transgenic animals.
- 13. How transgenic animals can help in the study normal physiology and development? (U)
- 14. How transgenic animals can help in the study diseases? (U)
- 15. Transgenic animals can be used to produce biological products. Justify with two examples. (A)
- 16. How transgenic animals can be help in the study of vaccine safety? (U)
- 17. How transgenic animals can help in the study chemical safety? (U)
- 18. Differentiate between pro-insulin and a mature insulin. (U)

THREE MARKS QUESTIONS:

- 1. Mention three critical research areas of biotechnology. (K)
- 2. What are genetically modified organisms? Mention any four benefits of genetically modified organisms. (K)
- 3. Mention six benefits of genetically modified organisms. (K)
- 4. What is Bt toxin? How does it kill cotton boll worms? (U)
- 5. Explain the procedure of developing nematode resistant tobacco plant by RNA interference. (U)
- 6. What is gene therapy? Explain the steps involved in curing ADA deficiency by gene therapy. (U)
- 7. Mention three applications of PCR as a tool of molecular diagnosis. (K)
- 8. Briefly explain the steps involved in PCR based molecular diagnosis to detect mutations in cancer patients. (U)
- 9. What is biopiracy? Explain it with respect to Basmati rice. (U)
- 10. Write a note on production of human insulin by genetic engineering. (U)
- 11. Explain any three benefits of creating transgenic animals.
- 12. What is biopiracy? Explain it with reference to Basmati Rice. (U)

FIVE MARKS QUESTIONS:

- 1. "Genetically modified plants can reduce the use of chemical pesticides". Justify this. (A).
- 2. Define RNA interference. Name the nematode for which tobacco plant was made resistant by this technique. Explain how this resistance was achieved in tobacco plant. (U)
- 3. Explain the applications of biotechnology in the field of medicine. (U)
- 4. One of the applications of biotechnology is the production of insect resistant crop plants. Justify the statement with reference to Bt cotton. (U)
- 5. Explain various techniques of molecular diagnosis. (U)
- 6. Give reasons: (A)
 - (a) Even though Bt toxin can kill many insects, it will not kill the bacteria that produces it.
 - (b) Even though Bt toxin is inactive, it kills the insect when enters its midgut.
 - (c) The gene encoding 'cry' protein inserted into a crop plants.

- (d) The translation of mRNA is prevented in RNA interference process.
- (e) It advisable to use insulin obtained through genetic engineering rather than insulin obtained from an animal source.
