ARS Main Descriptive Previous Questions - Agricultural Bio-Technology (2009)

Previous question papers

1. What are enzymes? Write characteristics of regulatory enzymes.

2. Give an account of different plant hormones and their applications in agriculture.

3. What is a gene? Write about the structure and mechanism of gene regulation.

4. Justify the impact of plant genetic engineering of crop improvement

5. What are expression vectors? Which DNA sequences are utilized to construct expression vectors? What are GATEWAY vectors?

6. Give differences between the following:

a) Type II and III restriction endonucleases

b) RT -PCR and Real -Time PCR

c) Spontaneous and induced fusion of protoplasts

d) Northern and Western blotting

7. How and when the split genes were discovered? Discuss the mechanism of production of a mRNA from a split gene.

8. What is pentose phosphate pathway? Describe the different steps involved in it.

9. How photosynthesis can be manipulated to increase the plant yield as well as to mitigate the green house effect?

10. Describe the detail the principle of Map based gene cloning.

11. What are secondary metabolites? Name the three important secondary metabolites being commercially produced through plant tissue culture. Why these secondary metabolites are not to the toxic to the plant cells producing them?

12. What are bio fertilizers? Discuss about the different bio fertilizers by giving suitable examples, which can be used to supplement the chemical fertilizers in agriculture.

13. What are transposable elements (TEs)? What potential role TEs have played in evolution of plants? How TEs have helped in the functional genomics? Explain.

14. Briefly described the salient features of BAC vector. Why it has been widely used for preparing the genomic DNA libraries?

15. A rice variety "x" has been found growing in coastal areas in Kerala. How can you identify the genes conferring salt tolerance in this variety?

16. What is allele mining? How can it be useful in the genetic improvement of crop species?

17. What is MALDI-TOF? Why it is preferred technique for peptide sequencing?

18. What is gene tagging and how it is different from gene targeting? Describe how a gene of interest can be isolated by gene tagging?

19. What is ribozyme technology? Describe the molecular basis of plant tolerance to various abiotic stresses.

20. What is abiotic stress? Describe the molecular basis of plant tolerance to various abiotic stresses.

21. What is molecular farming? Describe how the plants /animals can be used as bioreactors for production of pharmaceuticals of human interest?

22. Give briefly the contribution of the following scientists:

a) M.S Swaminathan

b) Gurudev Khush

c) Anand Chakrabarty

23. List all the crops in which the genome has been completely sequenced? Give their respective genome size. How the genome sequence can be utilized for crop improvement?

24. Write a brief note on new generation DNA sequencing system and the principle on which it is based.

25. Write short notes on the following:

a) Golden rice

b) Cry proteins

c) Gene silencing

d) Marker –assisted selection