

Anekant Education Society's
TULJARAM CHATURCHAND COLLEGE OF ARTS, SCIENCE AND COMMERCE,
BARAMATI, DIST – PUNE- 413 102

P. G. Research Centre, Department of Botany

Question Bank: M.Sc. I, Semester- II

Paper BOT-4203: Molecular biology and genetic engineering

Question 1 (2 marks):

1. Define C₀t value of DNA
2. What are Plasmids?
3. Enlist types of DNA
4. Enlist types of DNA damage
5. Enlist types of DNA repair.
6. What is Photoactivation?
7. Give role of RNA polymerase
8. Define GM plants.
9. Sketch and label t-RNA
10. Sketch and label structure of DNA
11. Define Exons and Introns
12. What are types of DNA polymerase
13. Sketch and label Ri-plasmid
14. What is vector? Give any two examples of it.
15. What are Cosmids?
16. Give types of Restriction endonucleases
17. What is YAC?
18. Enlist any four transgenic plants with suitable examples.
19. Define pUC vector
20. Define pBR vector
21. Define Ligases
22. Write any two example of Shuttle vector
23. *Agrobacterium* mediated gene transfer
24. Write any two properties of hyperchromicity of DNA
25. Enlist types of DNA damages.
26. Enlist types of DNA repair
27. Define Cot curve
28. Enlist Subunits of ribosome
29. Define operon. Enlist types of operon
30. Give the role of RNA polymerase.
31. What is cDNA?
32. Define C value paradox
33. Any four chemical characters about DNA
34. Enlist thermal properties of DNA
35. What is the composition of DNA?
36. Enlist two functions of RNA polymerase

Questions for 4 marks:

1. Write a note on Ti-plasmid
2. Give any four examples of GM crops for insect resistance.
3. *Agrobacterium* mediated gene transfer.
4. Write the organization of prokaryotic gene.
5. Write a note on Southern blotting.

6. Write a note on Northern blotting.
7. Write a note on Dot blot technique.
8. Give any two methods of DNA purification.
9. Discuss the chemical and thermal properties of DNA.
10. Genomic DNA library.
11. Write a note on *Tryptophan* operon.
12. Give an account for functions of r-RNA and m-RNA.
13. Explain rolling circle mechanism of replication.
14. What is plasmid? Describe pUC and pBR.
15. Write on translational inhibitors.
16. Give the mechanism of protein folding.
17. Explain Theta model of replication.
18. Sketch and label structure of Ti-plasmid.
19. Write a note on Ri-plasmids
20. C-value paradox.
21. Restriction endonucleases.
22. Comment on role of GM crops in insect resistance.
23. Comment on transgenic plant for fungal resistance.

Questions for 6 marks:

1. Explain in detail recombinant DNA technology.
2. Comment on *lac* operon concept.
3. Give an account of DNA replication in prokaryotes.
4. Give an account of DNA replication in Eukaryotes.
5. Explain direct methods of gene transfer in plants.
6. Explain initiation and elongation process of protein synthesis in eukaryotes.
7. Explain in detail different forms of DNA.
8. Explain in detail about transgenic plants with examples.
9. Describe protein synthesis in prokaryotes.
10. Describe types of RNA in detail.
11. Give an account for transcription in Eukaryotes.
12. Write a note on translation in eukaryotes.
13. Explain transcription in prokaryotes.
14. Comment on protein folding and processing.
15. What are Plasmids? Explain any two types in detail.
16. Write on post translational modification of protein.
17. Explain direct and indirect gene transfer in plants.
18. What is *lac* operon? Comment on negative regulation of gene.
19. Explain in detail on organization and structure of prokaryotic genes
20. Write in brief about organization and structure of eukaryotic genes
21. Give an account for transcription process in eukaryotes.
22. What is RNA processing? Add a note on methylation.

Questions for 12 marks:

1. Explain gene therapy with suitable example.
2. What is genomics? Give its applications in health.
3. Genetically modified crops and their applications in agriculture.
4. Describe role of *Agrobacterium* in detail for genetic improvement of plants.
5. How bacteria can uptake their nutrition like glucose? Give its genetic resemblance.
6. Describe recombinant DNA technology and its applications.
7. Write about protein synthesis process in humans.
8. Write on discovery of DNA and DNA as inheritance material?
9. How DNA transfers from one organism to other? Write on replication process of DNA.
10. What is semiconservative nature of DNA? Describe replication process.