

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1

DEPARTMENT OF ZOOLOGY

GENETICS AND BIOTECHNOLOGY (15CZO4A)

Section -A (UNIT -I)

1. F1 generation
2. Mendel's law
3. Mendelian characters
4. Back Cross
5. Test Cross
6. Monohybrid cross
7. Dihybrid cross
8. Punnet square
9. Phenotype
10. Genotype
11. Homologous chromosomes
12. Heterologous chromosomes
13. Alleles
14. Law of segregation
15. Law of dominance
16. Law of purity of gametes
17. Law of independent assortment
18. Gene interaction
19. Complementary factors
20. Supplementary factors
21. Inhibitory factors
22. Lethal factors
23. Atavism
24. Multiple alleles
25. Universal donor
26. ABO blood grouping
27. Monozygotic twins
28. Dizygotic twins

Section- B

1. Explain monohybrid cross with an example.
2. Give an account on the interaction of genes
3. Explain the complementary factors with an example
4. Explain the supplementary factors with an example
5. Give an account on the lethal genes
6. Write short note on atavism
7. Write a note on monozygotic and dizygotic twins

Section- C

1. What is dihybrid cross? Explain with example
2. What are multiple alleles? Explain blood groups and their inheritance in human.
3. What are complementary factors? Explain with an example
4. What are supplementary factors? Explain with an example

Section -A (Unit -II)

1. Linkage
2. Crossing Over
3. Coupling
4. Repulsion
5. Linked genes
6. Complete linkage
7. Incomplete linkage
8. Cis-arrangement
9. Trans-arrangement
10. Chiasma
11. Termination
12. Paring of genes
13. Torsion theory
14. Stern's Theory
15. Ascospore

16. Chromosomal Mapping
17. Sex determination
18. Sex linkage
19. X linked genes
20. Y linked genes
21. XY linked genes
22. Sex limited gene
23. Sex influenced gene
24. Barr Body
25. Gynandromorphs
26. Colour Blindness
27. Haemophilia
28. Holandric Genes
29. Klinefelter's syndrome
30. Turner's syndrome
31. Down syndrome/Mongolism/ Mongoloid idiosy
32. Hypertrichosis
33. Ichthyosis hystrix
34. Kappa particles
35. Paramecin
36. Cytoplasmic inheritance/Maternal inheritance
37. Karyotype

Section - B

1. Write about chromosomal mapping
2. Explain about sex determination in man.
3. Write notes on sex limited and sex influenced genes in man
4. Write about gynandromorphs
5. Explain the normal and abnormal human karyotyping

Section - C

1. What is linkage? Explain the mechanism of coupling and repulsion of linkage with suitable example

2. What is crossing over? Explain the mechanism crossing over and add the significance of it
3. What is Non-Disjunction? explain the various syndromes due to non-Disjunction
4. What is cytoplasmic inheritance? Explain the inheritance of kappa particles of paramecium as an example

Section- A (UNIT- III)

1. Gene
2. Cistron
3. Recon
4. Muton
5. Transcription
6. Translation
7. Nucleotides
8. Nucleoside
9. Promoter Gene
10. Regulator Gene
11. Inhibitor Gene
12. Exons
13. Intron
14. One gene one enzyme hypothesis
15. Operon concept
16. Lac operon
17. Mutation
18. Chromosomal Mutation
19. Inversion
20. Insertion
21. Deletion
22. Translocation
23. transformation
24. Duplication
25. Chromosomal Abberations

- 26. Inbreeding
- 27. Outbreeding
- 28. Hybrid Vigour/Heterosis
- 29. Aneuploidy
- 30. Euploidy
- 31. Polyploidy
- 32. Gene mutation/ Point mutation
- 33. Spontaneous mutation
- 34. Induced mutation
- 35. Mutagens
- 36. Gene regulation
- 37. Gene frequency

Section -B

- 1. Explain about the fine structure of gene
- 2. What is mutation? Explain about chromosomal mutation and gene mutation
- 3. Describe about the Operon concept
- 4. What is chromosomal aberration? Explain the mechanism of chromosomal aberrations
- 5. Give an account on inbreeding and out Breeding
- 6. Write short note on heterosis
- 7. What are the factors influencing gene frequency

Section- C

- 1. Explain gene concept and gene regulation in prokaryotes.
- 2. Explain gene concept and gene regulation in Eukaryotes.
- 3. What is mutation? Explain about chromosomal mutation and gene mutation.
- 4. What is Hardy Weinberg law ? Explain the mechanism of gene frequency and the factors affecting it What is operon concept explain the mechanism of Lac operon.

Section -A (UNIT -IV)

1. Restriction endonuclease/ Molecular Knife/ Molecular Scissor
2. DNA Ligases
3. Cloning vector
4. Plasmid/ pBR 322
5. λ Phage
6. Cosmid
7. Phagemid
8. Recombinant DNA/r DNA
9. Klenow enzyme/ Klenow Fragment
10. Taq DNA Polymerase
11. Linkers
12. Adaptors

Section B

1. Describe about scope of biotechnology.
2. Write notes on Restriction Endonucleases.
3. Give an account of linkers and adaptors with suitable example.
4. Write short note on cloning vectors.
5. Give an account on applications of rDNA technology.

Section C

1. Give an account on the tools of genetic engineering.
2. Explain the mechanism of rDNA technology.

Section -A (UNIT -V)

1. Gene cloning
2. cDNA
3. Genomic Library
4. Blotting techniques
5. Southern blotting
6. Northern blotting
7. Western blotting
8. DNA Sequencing

9. Vaccine
10. Nanotechnology
11. GMO
12. Interferons
13. Disease resistant crops

Section-B

1. Explain Gene cloning in prokaryotes
2. Write short note Genomic library
3. Explain the mechanism of Southern Blotting technique
4. Give an account on application of Nanotechnology in Medicine

Section -C

1. Explain the mechanism of various Blotting Techniques
2. Explain about the DNA Sequencing
3. Explain the applications of rDNA Technology in Human Welfare
4. Explain the applications of rDNA Technology in Agriculture
5. Define Nanotechnology and write about its application in medicine