**Reg. No. :** ☐☐☐☐☐☐☐☐☐☐☐

## Question Paper Code: 93D05

B.E./B.Tech. DEGREE EXAMINATION, DEC 2021

Third Semester

Bio technology

19UBT305- Principles of Genetics

(Regulation 2019)

Duration: Three hours                                                           Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

| | | |
|---|---|---|
| 1. | Define gene? Write short notes on Genome? | CO1- U |
| 2. | Define allele, phenotype and genotype | CO1- U |
| 3. | Differentiate between heterochromatin and Euchromatin. | CO1- U |
| 4. | Write a note on salivary gland chromosome of Drosophila | CO1- U |
| 5. | Classify the linkage based on different factors | CO1- U |
| 6. | What is interference? | CO1- U |
| 7. | What is Darwin's theory? | CO1- U |
| 8. | List out the models for population genetics. | CO1- U |
| 9. | What is muton? | CO1- U |
| 10. | What are complex or multifactorial disorders? | CO1- U |

PART – B (5 x 16= 80 Marks)

11. (a) What is a monohybrid cross? Explain the inheritance of one     CO1- U     (16)
gene, taking height of plant as a trait in Pisum sativum. Work out
the cross up to F2 generation**.**

Or

(b) Explain any three gene inheritances with a schematic     CO1- U     (16)
representation

12. (a) Illustrate the hierarchy of DNA condensation into chromosomes     CO3- App     (16)
in eukaryotic organisms.

Or

(b) Explain how DNA packaging in both eukaryotic and prokaryotic cells protects genetic information    CO3- App    (16)

13. (a) Explain the phenomenon of linkage with respect to Morgan's Experiment. Add a note on the differences between complete and incomplete linkage    CO1- U    (16)

<div align="center">Or</div>

(b) Explain the cytological basis and molecular mechanisms of crossing over    CO1- U    (16)

14. (a) Give a note on Hardy-Weinberg Equilibrium. Elaborate in detail about Extensions of Hardy- Weinberg equilibrium in population analysis.    CO1- U    (16)

<div align="center">Or</div>

(b) Discuss in detail about any 3 models for population genetics    CO1- U    (16)

15. (a) Explain in detail about mutagens, DNA mutations and their mechanism, elaborate about the types of genetic mutations    CO1- U    (16)

<div align="center">Or</div>

(b) Give an account of various types of repair mechanisms and discuss in detail about the significance of DNA repair mechanism    CO1- U    (16)