

**2022**

**M.Sc.**

**2nd Semester Examination**

**MICROBIOLOGY**

**PAPER—202**

*Full Marks : 50*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**UNIT-202.1 FUNDAMENTAL GENETICS**

**Group - A**

Answer any two questions.

2×2

1. What is nucleoid?

*(Turn Over)*

2. Mention the role of histone acetyl transferase and histone deacetylase?
3. Define polygenic trait with example.
4. What is C-value paradox?

### Group - B

Answer any *two* questions. 2×4

5. 'Linkage is inversely proportional with recombination' – Explain. Gene A, B, C and D are located on the same chromosome. The recombination frequencies are as follows: B-D= 14%, C-D= 12%, A-D= 6%, B-C= 2%, A-B= 8%. What is the order of genes on the chromosome? 2+2
6. What is competence? State the significance of Hfr strain in bacterial evolution. 1+3
7. Explain the Bombay blood group with respect to epistatic phenomena.
8. 'Among different ABO-blood groups complete dominance and incomplete dominance and multiple allelic character can be exemplified' – Explain.

**Group - C**

Answer any *one* question. 1×8

9. Explain the mechanism of dosage compensation of human and drosophila. Write the mechanism of generalized transduction. 4+4
10. Write short note on: linkage group, X-linked dominant trait, transposon, Hardy-Weinberg principle. 4×2

**UNIT-202.2 GENE REGULATION****Group - A**

Answer any *two* questions. 2×2

1. Why do mutation "hotspots" exist in regions rich in methylated cytosines?
2. What do you mean by polycistronic mRNA?
3. What is catabolite repression?
4. Differentiate between siRNA and RNAi.

**Group - B**

Answer any *two* questions. 2×4

5. What is SOS repair? When this type of repair takes place? 2+2
6. What is Shine-Dalgarno sequence? What is the importance of this sequence in translation? 2+2
7. How does glucose molecule regulate the expression of lac operon in *E. coli*?
8. Distinguish between the functions of promoters and enhancers in transcriptional regulation.

**Group - C**

Answer any *one* question. 1×8

9. Write note on: lytic and lysogenic switching, role of topoisomerase in DNA replication. 4+4
10. Transcription of the trp operon can be reduced through a combination of repression using an aporepressor and attenuation - Explain the mechanism.

} Internal Assessment - 10 Marks }