SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

M.Sc.-Biotechnology – I Year (I Sem)

Course Name: Molecular Genetics	**Code:MSB1009**
Time: 02 Hours	**Max Marks: 60**

University Roll No.															

(To be filled by the Student)

Note: Please read instructions carefully:

a) The question paper has 03 sections and it is compulsory to attempt all sections.

b) All questions of Section A are compulsory; questions in Section B and C contain choice.

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Define oncogenes and their types.	BL1	CLO2	02
2.	What is epistasis? Give examples.	BL1	CLO2	02
3.	What is chromosome mapping?	BL1	CLO3	02
4.	Define pedigree.	BL1	CLO3	02
5.	Name one trait in humans which shows codominance.	BL1	CLO1	02
Section B: Short Answer Type Questions **Attempt any 03 out of 06 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Summarize Mendel's laws of inheritance with an explanation as to why Mendel chose pea plants for his experiments.	BL2	CLO1	10
2.	Discuss how the transposons were discovered in genes of maize.	BL2	CLO2	10
3.	Explain the Hardy- Weinberg principle.	BL4	CLO4	10
4.	A colour blind man has a normal brother and colour blind sister. What should be the phenotypes of the parents?	BL1	CLO2	10
5.	Match the following organism with the type of sex determination found in them Column I — Column II A) ZW-ZZ type — M) Grasshopper B) ZO-ZZ — N) Drosophila C) XX-XO — O) Hen D) XX-XY — P) Butterfly	BL1	CLO4	10
6.	Explain the different types of variations in chromosome structure.	BL4	CLO2	10

Section C: Long Answer Type Questions/Case Study **Attempt any 01 out of 03 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Pea plants are crossed to demonstrate independent assortment. The traits tested are listed below. The capital letter indicates the dominant allele. Seed Color (Yellow vs. green) Seed Shape (Round vs. wrinkled) Flower Color (Purple vs. white) Plant Height (Tall vs. dwarf) Pod Shape (Inflated vs. constricted)	BL1	CLO1	20

	Use the information provided above and in each question to determine the correct answers. **a)** Draw Punnett Squares. **b)** Determine the probability of having an offspring that has a round, green seed. **c)** Determine the probability of having an offspring that has round, yellow seeds in a constricted pod. The plants these pods are taken from must be tall with purple flowers. **d)** Determine the probability of having an offspring that shows exactly four recessive traits. **e)** Determine the probability of having an offspring that expresses all five dominant phenotypes.			
2.	Explain autosomal recessive and autosomal dominant inheritance with suitable examples.	BL2	CLO1	20
3.	Elaborate the XX-XY mechanism of sex determination in mammals.	BL6	CLO3	20
