Enrollment No._____

NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Science
Program/s: MSc
Year: 1st **Semester:** 1st
Examination: End Semester Examination
Examination year: December 2022

Course Code: LS105 **Course Name:** Genetics
Date: 08/12/2022
Time: 08:30 am to 10:30 am

Total Marks: 40
Total Pages: 2

Instructions:

- *Write each answer on a new page.*
- *Use of a calculator is permitted/~~not permitted~~.*
- **COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping*

Q. No.	Details	Marks	COs*	BTL*
Q.1	**Objective-based questions. (1M x 15Q = 15M)** 1. In 4 O'clock plant Mirabilis jalapa, pink flower-producing plants were produced when: a) 2 red flowered plants were crossed b) A pink flowered plant was crossed with a white flowered plant c) Two white flowered plants were crossed d) A red flowered plant was crossed with a white flowered plant 2. The phenotypic ratio in a monohybrid cross showing incomplete dominance is: a) 9:3:3:1 c) 3:1 b) 1:2:1 d) 1:2:1:2:4:2:1:2:1 3. A pea plant producing yellow round seeds is crossed with a green wrinkled plant (yyrr). Two types of offspring are produced – those producing yellow round seeds & those producing yellow wrinkled seeds in the ratio of 1:1. The genotype of the yellow round plant is: a) YYRR c) YyRR b) YYRr d) YyRr 4. According to Mendel, in a cross involving a pair of alleles, a) Both alleles blend & express together in the F1 generation. b) Both alleles come and stay together but do not blend. c) Any one allele enters the F1 organism. d) Both alleles disappear in the F1 generation. 5. This is not a valid reason for Mendel to select pea plants for his experiments: a) The flowers of pea plants are unisexual. b) Pea plants possess contrasting traits. c) Cross pollination by insects is impossible. d) Life span of pea plants is reasonably short. 6. Karyotyping require metaphase chromosome. Write true or false with proper justification. 7. Fibroblast culture need a complete media. Write true or false with proper justification. 8. How polygenic inheritance contributes to human genetics? 9. How heterokaryon helps in gene mapping. 10. Differentiate between G- and Q-banding. 11. How density gradient media help to separate blood cell? 12. How annotation identifies gene sequence? 13. How marker assisted selection helps in agriculture? 14. Which stain is used in endospore staining?	15	CO1, CO2, CO3, CO4, CO5, CO6	BT1, BT2, BT3, BT4, BT6

	15. Draw a figure of bacteriophage T4.			
Q.2	**Short answers. (3M x 5Q = 15M)** 1. What were the pea plant traits that Mendel studies for his experiments? 2. State the difference between incomplete dominance and co-dominance with appropriate examples. 3. How will you compare tumor and normal genomes by hybridization technique? 4. What is the significance of banding techniques? Explain 3p22.1 chromosome region with diagrammatic representation. 5. How vibrio are different from spirilla? Explain differential staining based on the presence of peptidoglycan in bacteria. 6. Differentiate between old and new genome sequencing technique.	**15**	CO1, CO2, CO3, CO4, CO5, CO6	BT1, BT3, BT5 BT6
Q.3	**Long answers. (5M x 2Q = 10M)** 1. Describe Mendelian laws with their respective examples. 2. Design a detailed experiment to study gene X, Y, and Z on chromosome number 6th in human cell line. 3. Explain- How will you demonstrate an ordered gene transfer using three different strains.	**10**	CO1, CO2, CO3, CO4, CO5, CO6	BT1, BT3, BT4, BT5, BT6

**********End of Question Paper**********