

BZYCT-137: Genetics and Evolutionary Biology

Course Code	BZYCT-137
Course Title / Subject	Genetics and Evolutionary Biology
Programme	B.Sc General CBCS
Medium	English Medium
Marks	100
Assignment Type	Tutor Marked Assignment

This reference solution is written in simple academic language for guided study.

Official Assignment / Syllabus Page

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4. i) Define mutation. Explain the following types of mutations briefly: (5)
 a) Induced mutations
 b) Suppressor mutations
 ii) What are transposable genetic elements? How they can cause mutations? (5)
5. i) Industrial melanism is an excellent model to demonstrate the natural selection in action. Analyze the above statement critically. (5)
 ii) What do you understand by sexual selection? Illustrate your answer with a suitable example. (5)
6. Define the following terms: (2×5=10)
 i) Heterozygous
 ii) Chromosome mapping
 iii) Genetic drift
 iv) Frame shift mutation
 v) Dosage compensation
7. What is speciation? Explain the mode of speciation. (10)
8. i) Write a note on the applications of polyploidy. (5)
 ii) Explain the natural causes of extinction of a species. (5)
9. Explain the Trisomy 13 – Patau syndrome in detail. (10)
10. Explain in detail the technique used for determining the age of rocks. (10)

Solved Answers

Answer 1: i) How is co-dominance different from incomplete dominance? ii) Explain the phenomenon of masking the expression of a gene by another in epistasis. (ignoucollage.in)

About 250 words

The study and understanding of **i) how is co-dominance different from incomplete dominance? ii) explain the phenomenon** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **i) how is co-dominance different from incomplete dominance? ii) explain the phenomenon** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **i) how is co-dominance different from incomplete dominance? ii) explain the phenomenon** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **i) how is co-dominance different from incomplete dominance? ii) explain the phenomenon** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

Answer 2: i) In Drosophila, the recessive, sex-linked genes, abnormal eyes facet (fa) and singed bristles (sn) show 18 percent recombination. a) If a singed male is crossed to a fa fa female, what phenotypes are expected in the F1? b) If the F1 males and females are inbred, what phenotypic proportions would be expected to occur in F2 males and females? ii) Two recessive genes, ds and mp are present in corn. These are linked and are 20 map units apart. From the cross: mp ds mpds What percentage of the progeny would be expected to be both ds and mp in the phenotype? (ignoucollage.in)

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Answer 3: a) In the following statements, choose the alternate correct word given in parenthesis. i) The DNA regions in chloroplast could be observed under (light microscope/electron microscope). ii) The regions containing cpDNA are called (nucleoids/celluloids). iii) Each nucleoid contains (a single/a few) copies of DNA. iv) The cpDNA and mtDNA are usually (circular/linear) in nature. v) Both chloroplast and mitochondria contain (a few/many) copies of DNA. vi) The mtDNA of yeast is (bigger/smaller) than mtDNA of humans. vii) The occurrence of introns is discovered in (yeast/human). b) Which among the following statements are correct? i) Mitochondria contain 80 S ribosomes. ii) The mRNA encoded by nuclear genes for the smaller subunit of RuBisCo is translated in the chloroplast. iii) The inheritance of chloroplast genome is independent of nuclear genome. (ignoucollage.in)

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Answer 4: i) Define mutation. Explain the following types of mutations briefly: a) Induced mutations b) Suppressor mutations ii) What are transposable genetic elements? How they can cause mutations? (ignoucollage.in)

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Answer 5: i) Industrial melanism is an excellent model to demonstrate the natural selection in action. Analyze the above statement critically. ii) What do you understand by sexual selection? Illustrate your answer with a suitable example. (ignoucollage.in)

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Answer 6: Define the following terms: i) Heterozygous ii) Chromosome mapping iii) Genetic drift iv) Frame shift mutation v) Dosage compensation (2×5= (ignoucollage.in)

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Answer 8: i) Write a note on the applications of polyploidy. ii) Explain the natural causes of extinction of a species. (ignoucollage.in)

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Answer 9: Explain the Trisomy 13 – Patau syndrome in detail. (ignoucollage.in)

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Answer 10: Explain in detail the technique used for determining the age of rocks. (ignoucollage.in)

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