

**II B.Tech. I Semester Supplementary Examinations, May -2005**

**GENETICS**

**(Bio-Technology)**

**Time: 3 hours**

**Max Marks: 80**

**Answer any FIVE Questions  
All Questions carry equal marks**

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1. Discuss Mendel's postulates based on his monohybrid cross results.
2. What observations are consistent with the conclusion that DNA serves as the genetic material in eukaryotes? List and discuss them.
3. What is linkage? Describe Linkage with a suitable experiment.
4. Describe the conditions under which genetic recombination may occur in bacteriophage?
5. What are chromosome aberrations? What are the types of chromosome aberrations found in cells?
6. Give an account of spontaneous mutations? Describes their significance.
7. How sex is differentiated and developed in humans.
8. Give the genotypes involved when a sinistral female snail produces dextral offspring. What genotypes could the male parent of the sinistral female have?

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1. Discuss Mendel's postulates based on his monohybrid cross results.
2. What observations are consistent with the conclusion that DNA serves as the genetic material in eukaryotes? List and discuss them.
3. Describe the mechanism of genetic recombination.
4. Describe the origin of F' bacteria and merozygotes.
5. What are the structural properties of transcribed genes and role of active nucleosome?
6. A point mutation occurs in a particular gene. Describe the types of mutational events that can restore a functional protein, including intergenic events. Consider missense, nonsense, and frameshift mutation.
7. Define lyon hypothesis.
8. A dextral snail is self fertilized and produces only sinistral progeny. What is the probable genotype of this snail and its parents?

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1. What type of crosses would produce the following genetic ratios?
  - (a) 3:1
  - (b) 1:1
  - (c) 1:2:1
  - (d) 9:3:3:1
2. Why were  $^{32}P$  and  $^{35}S$  chosen for use in the Hershey-Chase experiment? Discuss the rationale and conclusions of this experiments.
3. What is the significance of genetic recombination to process of evolution?
4. Describe the conditions under which genetic recombination may occur in bacteriophage?
5. Write a note on different types of polyploidy with specific examples.
6. Describe the Ames assay for screening potential environmental mutagens. Why is it though that a compound that tests positively in the Ames assay may also be carcinogenic?
7. What evidence suggests that Down syndrome is more often the result of non-disjunction during oogenesis rather than spermatogenesis?
8. What is kappa in *Paramecium*?

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1. What do you mean by Epistatis? Write the mechanism of epistatis. (any 3).
2. Why were  $^{32}P$  and  $^{35}S$  chosen for use in the Hershey-Chase experiment? Discuss the rationale and conclusions of this experiments.
3. Describe the experiment of Creighton and McClintock that demonstrated that recombination involved a physical exchange of chromosomal material?
4. Describe the conditions under which genetic recombination may occur in bacteriophage?
5. Give the gametic complement, in term of acentric, dicentric, duplication and deficiencies.
6. Give an account of spontaneous mutations? Describes their significance.
7. Write the mechanism of sex determination in human.
8. Describe the types of evidence that could be gathered to determine whether a trait in *E.coli* is controlled by chromosomal or plasmid genes. Explain about cytoplasmic inheritance.

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