

**II B.Tech I Semester Regular Examinations, November 2005**

**GENETICS**

**(Bio-Technology)**

**Time: 3 hours**

**Max Marks: 80**

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

\*\*\*\*\*

1. (a) Describe law of segregation  
(b) law of independent assortment. [8+8]
2. (a) Differentiate between nucleotides and nucleosides.  
(b) Which are the bases unique to DNA and RNA?  
(c) What chemical group is found at the 5' end and 3' end of a DNA chain?  
(d) What is a DNA oligomer?  
(e) Role of telomeres and centromeres?  
(f) Differentiate between A-DNA, B-DNA and Z-DNA.  
(g) Differentiate between karyotype and idiogram. [2+2+2+2+2+3+3]
3. What is the relationship between recombination frequency and genetic distance? [8+8]
4. Describe the conditions under which genetic recombination may occur in bacteriophage? [16]
5. Write a note on structure and organization of Lampbrush chromosomes. [4+12]
6. Differentiate between gene mutation and point mutation. [8+8]
7. What is a sex switch? What genes serve as sex switches in human beings and *Drosophila*? [4+12]
8. A mutation in the mitochondrial genome in people causes blindness. If reciprocal matings between affected and normal individual occur in a family pedigree, what types of children would you expect from each cross? Explain. [6+10]

\*\*\*\*\*

**II B.Tech I Semester Regular Examinations, November 2005**

**GENETICS**

**(Bio-Technology)**

**Time: 3 hours**

**Max Marks: 80**

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

\*\*\*\*\*

1. Describe Mendel's second law in terms of the alleles that segregate independently. [4+12]
2. Discuss the role of histones and non-histone proteins in DNA packing. [4+12]
3. Write a note on incomplete linkage and crossing over. [8+8]
4. Define plaque, lysogeny and prophage. [4+5+7]
5. What is translocation? Write about reciprocal, insertional and Robertsonian translocation. [4+12]
6. What are chemical mutagens? Describe their significance. [5+11]
7. What conclusions have been drawn about human aneuploidy as a result of karyotypic analyses of aborted fetuses? [16]
8. Write a note on killer paramecium and kappa particles. [6+10]

\*\*\*\*\*

**II B.Tech I Semester Regular Examinations, November 2005**

**GENETICS**

**(Bio-Technology)**

**Time: 3 hours**

**Max Marks: 80**

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

\*\*\*\*\*

1. Write details about the genotypic interaction in mono hybrid, di-hybrid and tri-hybrid cross. [4+5+5]
2. Does the design of the Hershey-Chase experiment distinguish between DNA and RNA as the molecule serving as the genetic material? Why or Why not? [4+12]
3. When analyzing a segregation ratio of phenotypes in one population, what result suggests that two genes are linked on the same chromosome? [16]
4. What is transformation? [16]
5. Give the gametic complement, in term of acentric, dicentric, duplication and deficiencies. [4x4]
6. What are mutagens? Classify the radiation, chemical mutagens that are affecting the organisms. [3+13]
7. What evidence suggests that Down syndrome is more often the result of non-disjunction during oogenesis rather than spermatogenesis? [16]
8. Write a note on killer paramecium and kappa particles. [6+10]

\*\*\*\*\*

II B.Tech I Semester Regular Examinations, November 2005

**GENETICS**

**(Bio-Technology)**

**Time: 3 hours**

**Max Marks: 80**

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

\*\*\*\*\*

1. What two experimental innovations did Mendel use that allowed him to discover the laws of genetics? [6+10]
2. Write a note on role of internal and external environmental factors influencing the specific gene expression. [8+8]
3. How to derive linkage distance and Gene order from three-point crosses? [8+8]
4. Why are the recombinants produced from an Hfr X  $F^-$  cross never  $F^+$ ? [16]
5. What are various types of inversions? How do they occur in organisms? [8+8]
6. Focus light on the molecular basis of mutations. [16]
7. Write the mechanism of sex determination in plants. [16]
8. What do you mean by extra chromosomal inheritance? Write an example how it transfers to next generation. [4+12]

\*\*\*\*\*