B.N.BANDODKAR COLLEGE OF SCIENCE, THANE

S.Y. B.Sc ATKT EXAMINATION FEBRUARY 2011

BIOTECHNOLOGY Paper –II

Total Marks: 90

Duration: 3hrs.

NB:

1. **Illustrate your answers with suitable examples.**
2. **All Questions carry equal marks.**

Section 1

Q1. A. Explain of the following terms: 3M

1. Homogametic sex
2. Sex linkage
3. Crisscross inheritance

B. Answer the following (any3) 12M

1. What is 'X chromosome non-disjunction'? Explain with a suitable example.
2. Write a note on X chromosome inactivation.
3. Write a note on gene segregation in meiosis
4. Explain with the help of examples: X-linked inheritance
5. Elaborate on chromosome theory of inheritance

Q2. A. Define the following terms. 3M

1. Bidirectional replication
2. Theta replication
3. SOS repair

B. Answer the following (any 3) 12M

1. Explain the prokaryotic replication initiation with the help of neat labeled diagram.
2. Explain termination of prokaryotic replication using a neat labeled diagram.
3. Write a note on sigma replication.
4. Give a brief account of excision repair.
5. Explain Messelson and Stahl experiment to prove semi-conservative replication.

Q 3. A. Explain the following terms. 3M

1. Mutation rate
2. Cri-Du-Chat syndrome.
3. Philadelphia chromosome.

B. Answer the following (any 3) **12M**

1. How would you detect mutations in bacteria and viruses?
2. What are reverse mutations? Explain using different examples.
3. Explain packaging of eukaryotic chromosomes in nucleosomes.
4. Explain the karyotype and mechanism of occurrence of Down's syndrome.
5. What is chromosome banding? How is this technique useful in cytogenetics?

Section 2

Q 4. A. Explain: **3M**

1. Branch migration
2. Pedigree
3. Crossing over

B. Answer the following (any 3) **12M**

1. A cross between a pink (p-) yeast strain of mating type a and a cream strain (p+) of mating type alpha produces the following tetrads:

18	p+ a	p+ a	p- α	p- α
8	p+ a	p- a	p+ α	p- α
20	p+ α	p+ α	p- a	p- α

On the basis of these results, are p and mating type genes on separate chromosomes?

2. Explain in detail: Discovery of genetic linkage
3. Write a note on Holliday model
4. in the Chinese primrose, slate colored flowers (s) is recessive to the blue flower (S), red stigma (r) is recessive to green stigma ®, and long style (i) is recessive to short style (L. all the genes are on the same chromosome. The F1 of a cross between two true-breeding stains, when test crossed gave the following progeny phenotype:

Q 5. A. Explain any three of the following terms **3M**

1. Reverse transcription
2. Rho factor
3. RNA editing
4. mRNA capping
5. poly A tail

B. Answer any two of the following. **12M**

1. Explain the degeneracy of 'genetic code'.
2. Explain transcription termination in prokaryotes.
3. What is splicing? Explain the splicing process in brief.

Q 6. A. Explain: **3M**

1. Z linked genes
2. Non mendelian inheritance
3. Reverse mutation

B. Answer the following (any 3) **12M**

1. Give an account of sex-linkage in Man with respect to colourblindness.
2. Give an account of sex-linkage in Man with respect to Haemophilia.
3. Write note on: Holandric genes
4. Explain the origin of mitochondria and chloroplasts.