KERALA AGRICULTURAL UNIVERSITY

B.Sc. (Ag) 2003 Admission - V Semester Final Examination

July - August 2006

Biot 302

Molecular Biology (1+0)

Max. Marks: 60

Time: 2 hours

I. a. Fill in the Blanks $10 \times 0.5 = 5$

1. Additional endogenous sequences are produced by ----------.
2. A reciprocal exchange of end segments of chromosome 8 is found in cancer cells of ----------.
3. A random exonuclease removes ---------- from its substrate.
4. ---------- coined the term somoclonal variation.
5. All oncogenes are dominant to their wild type alleles ----------.
6. The klenow fragment has the 5' – 3' exonuclease activity also ----------.
7. Type II restriction enzymes are mostly used as biotechnology tools ----------.
8. The matching of each codon t its particular amino acid is mediated by ----------
9. The process by which introns are removed is called ----------.
10. In eukaryote the genetic material is well organized in the ----------.



I. b. Answer as True or False $10 \times 0.5 = 5$

11. EcoRI produces a blunt ended DNA
12. Type II restriction enzymes recognize a specific sequence but makes a cut elsewhere.
13. Promoter sequence lies at the 3' end of a gene.
14. Quaternary structure of a protein does not involve subunits.
15. MS medium is generally used in plant tissue culture.
16. IgG is the first antibody produced against an antigen.
17. RAPD technique requires large amounts of DNA.
18. Introns are the expressed sequences of a gene.
19. Recombinant DNA technology involves restriction enzymes.
20. Microsatellite markers are also called STS markers.

II. Answer the following $6 \times 1 = 6$

1. What are proto-oncogenes?
2. Define genes.
3. What is a 'silent mutation'?
4. Which is the starting aminoacid in bacterial protein synthesis?
5. How are the codons that specify the same aminoacids are called?
6. Give at least two differences between a genomic library and cDNA library?

**III. Write short notes on any *six* of the following** 6 x 2 = 12

1. What are tumor suppressor genes? Give two examples.
2. Write the differences between somoclonal and gamatoclonal variations.
3. What you mean by a restriction map?
4. What are the different classes of nucleases?
5. What are the different mechanisms that cause changes in DNA?
6. What are the changes that take place when a cell become tumourigenic and how this is effected?
7. Describe the process of genetic transformation using *Agrobacterium*.
8. Explain the 3-dimensional structure of a protein

**IV. Answer any *four* of the following** 4 x 3 = 12

1. Explain DNA transfer by particle bombardment.
2. Mention different types of nucleases and their significance.
3. Explain the molecular basis of three different DNA markers.
4. How will you isolate a recombinant phage by nucleic acid hybridization? Explain with neat diagram.
5. Describe with a diagram the construction of genomic library.
6. How can the genetic engineering improve the nutritional value of food? Explain with an example.

**V. Answer in detail any *four* of the following** 4 x 5 = 20

1. Explain the different applications of restriction endonucleases.
2. Explain the different DNA markers and how they can be used in marker assisted selection.
3. How will you construct a genomic library and identify a gene of interest?
4. Write on tumour suppressor genes and DNA viruses.
5. Distinguish positive & negative control of gene regulation in prokaryotes?