**GENETIC ENGINEERING (R09) 2011**

**SET 1**

1. Write a short notes on:
   1. Application of linkers and adaptors in cDNA cloning.
   2. Vectors used for cDNA cloning.
2. Discuss the basic principle involved in PCR technique in detail.
3. Define recognition sites and explain their properties.
4. Define gene therapy. Explain in detail ex - vivo gene therapy and its application.
5. Discuss in detail the prokaryotic promoters.
6. Write short notes on:
   1. Nucleotide analogs.
   2. Sequencing gel.
7. Discuss the variants of RAPD in detail.
8. Explain the mechanism of transposition and excision.

**SET 2**

1. Write short notes on colE1plasmid and pBR327.
2. Write short notes on:
   1. Homopolymer tailing
   2. Physiological significance of restriction & modification system.
3. Comment on:
   1. Application of Homopolymer Tailing in cDNA cloning.
   2. Subtractive cloning.
4. Explain the advantages & disadvantages of chemical degradation method.
5. Explain the organization of the lac operon & other genes involved with lactose metabolism in E coli.
6. Write short notes on
   1. Problems encountered in PCR & their solutions.
   2. Application of PCR in modern molecular biology.
7. Write about transgenic animals as bioreactors for the production of therapeutically important proteins.
8. Discuss the significance of photolabile protecting groups in the manufacture of DNA chips. Give two examples of photosensitive groups.

**SET 3**

1. Write about complementation's or suppression of mertant phenotype in the cloning cell or selection of recombinant-deficient phages.
2. What are DNA micro chips? Write about support media & the strategies adopted for cross linking & immobilization of DNA on the surface of support media.
3. Enumerate the factors that affect the PCR reaction at various steps.
4. Explain the principle & steps involved in gel retardation assay.
5. Write about
   1. T7 DNA polymerase and its applications
   2. Polynucleotide kinase and its applications.
6. Classify plasmids based on size, copy number and function in detail.
7. Discuss in detail gene delivery by non - viral systems.
8. Discuss control of transcription termination in prokaryotes.

**Set 4**

1. Briefly describe gene knock out & its applications.
2. Mention the properties, a plasmid should possess for its use in recombinant DNA.
3. Write the principle & procedure of ultrasonication.
4. How is PCR useful in medical diagnosis & forensic science.
5. Write about AFLP primers and adaptors. What are the advantages of AFLP.
6. Explain the synthesis of cDNA using oligo G primer.
7. Write about regulation of araBAD operon.
8. Discuss the role of restriction enzymes in restriction mapping. Discuss the significance of double digestion in the process.