Code No: R05312304 **Set No. 1**

III B.Tech I Semester Regular Examinations, November 2008
GENETIC ENGINEERING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the regulation of gene expression in Lac operon in detail including both the positive and the negative regulation. [16]
2. Can you explain taking the example of a single type of regulatory protein, how the process of regulation of gene expression occurs in eukaryotes. [16]
3. Differentiate between:
   (a) plasmids and episomes
   (b) insertion sequences and transposons. [8 × 2]
4. Comment on the following:
   (a) vectors that are useful for DNA sequencing.
   (b) vectors used for construction of genomic libraries. [8 × 2]
5. Explain the dideoxy method in detail. [16]
6. What is a primer? Discuss its role in DNA replication and add a note on its importance and usefulness in PCR. [16]
7. What are the applications of gene chips? Explain in detail. [16]
8. What are muteins? How are these produced by employing the principles of protein engineering and recombinant DNA technology? [16]

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Code No: R05312304 **Set No. 2**

III B.Tech I Semester Regular Examinations, November 2008
GENETIC ENGINEERING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. How the operon concept was first developed? Explain by citing the initial experimental observations. [16]
2. Which type of regulatory proteins are involved in controlling development? Explain in detail. [16]
3. What properties do plasmids confer on their host cells? [16]
4. Write short notes on:
   (a) expression vectors
   (b) shuttle vectors
   (c) phage vectors
   (d) cosmid vectors. [4 × 4]
5. Explain the recent developments in DNA sequencing. [16]
6. Explain the different applications of PCR. [16]
7. How are the DNA arrays produced? Discuss some of the technologies available for the production. [16]
8. What are the three major methods of obtaining transgenic mice? [16]

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Code No: R05312304 **Set No. 3**

III B.Tech I Semester Regular Examinations, November 2008
GENETIC ENGINEERING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. How is the activity of the amino acid biosynthetic operons regulated? Explain in detail by citing any single example. [16]
2. What does gene amplification mean? How is it different from gene duplication? [16]
3. How can you detect transposition in bacteria? Explain in detail the process of transposition. [16]
4. What are the different types of cloning vectors used in genetic engineering? [16]
5. A particular protein gene was inserted in pBR 322 and pET vector and transformed into E.coli. How do you go for detection of the recombinant clones in bacteria transformed using both the vectors? Explain the basic differences in the two vectors. [16]
6. Explain the principle and the process of PCR. [16]
7. Discuss the concept of gene-chip and micro-arrays in detail. [16]
8. Comment on:
   (a) Ex vivo gene therapy
   (b) In vivo gene therapy. [8+8]

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Code No: R05312304 **Set No. 4**

III B.Tech I Semester Regular Examinations, November 2008
GENETIC ENGINEERING
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. How do you define an operon? Explain the Control of gene expression in bacteria by citing the example of any operon. [16]
2. Explain what you understand by gene rearrangements. Is this comparable to gene shuffling? Give your comments. [16]
3. What are retrotransposons? Explain in detail with examples. [16]
4. List out the enzymes required for:
   (a) Removal of phosphate group
   (b) Joining of two DNA fragments
   (c) Cleavage of DNA
   (d) Removal of single stranded regions in double stranded DNA
   (e) Addition of phosphate group at 3? end of DNA
   (f) Addition of phosphate group at 5? end of DNA
   (g) Synthesizing DNA probes for hybridization purposes
   (h) Amplification of DNA. [2 × 8]
5. Write short notes on:
   (a) differential screening
   (b) North-Western blotting. [16]
6. What are the different factors that one should take into consideration for obtaining a successful amplification in PCR? [16]
7. How are micro-arrays useful in studying gene expression or in disease profiling.[16]
8. What should be the strategy to produce a glycosylated protein? Would you use E. coli or a yeast system? [16]

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