



Name :

Roll No. :

Invigilator's Signature :

CS/M.TECH(B.T)/SEM-1/MBT-101/2011-12

2011

GENETIC ENGINEERING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

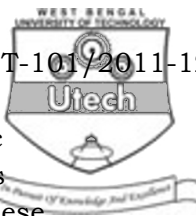
1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Which of the following could not be the recognition site of a Restriction Endonuclease ?
- | | |
|-----------|-----------|
| a) GAATTC | b) ATCGAT |
| CTTAAG | TAGCTA |
| c) CTGCAG | d) GCTTGC |
| GACGTC | CGAACG |
- ii) The single stranded ends of DNA molecules can be joined together by
- | |
|------------------------------|
| a) Restriction Endonucleases |
| b) DNA Ligase |
| c) Primase |
| d) Helicase. |



- iii) The first step in cloning a gene is to
 - a) isolate the DNA from the organism that contains the desired gene
 - b) insert a plasmid into a bacterium
 - c) treat plate cells on agar
 - d) treat plasmids with restriction enzymes.
- iv) A microarray is a/an
 - a) ray of a small wavelength
 - b) type of ultraviolet ray
 - c) RNA probe used to identify viruses
 - d) arrangement of oligonucleotide probes, closely arranged on a small solid support surface.
- v) PCR requires all of the following except
 - a) Primers
 - b) DNA ligase
 - c) DNA polymerase
 - d) Deoxyribonucleotides.
- vi) If you start with one double stranded DNA molecule and you perform SIX cycles of PCR, how many double stranded copies of the DNA will you have ?
 - a) 8
 - b) 16
 - c) 32
 - d) 64.
- vii) DNA probes are used to
 - a) locate complementary RNA sequences in a test sample
 - b) make homologous DNA
 - c) make homologous RNA
 - d) locate a specific DNA nucleotide sequence in a test sample.
- viii) consist of recombinant cells containing different fragments of a foreign genome.
 - a) DNA probes
 - b) Homologous recombinants
 - c) Genomic libraries
 - d) Knockout organisms.



- ix) Ti plasmids are used to create transgenic
 - a) plants
 - b) animals
 - c) fungi
 - d) all of these.
- x) cDNA is made from
 - a) mRNA
 - b) rRNA
 - c) DNA
 - d) Plasmids.
- xi) The first drug produced using recombinant DNA technology was
 - a) streptokinase
 - b) tPA
 - c) insulin
 - d) penicillin.
- xii) Genetic engineering manipulates gene products at the level of
 - a) DNA
 - b) RNA
 - c) Amino Acid
 - d) Protein.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following 3 × 5 = 15

2. Write down a short note on YAC.
3. Distinguish between cDNA library and genomic library.
4. Why is Gateway cloning technology better than other cloning methods ?
5. Write short notes on any *two* of the following : 2 × 2½
 - a) ALP
 - b) PNK
 - c) Klenow Fragment.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

6. Describe different types of hybridization techniques. What is PCR ? Discuss about the method of amplifying a specific DNA fragment by PCR and its uses. 8 + 1 + 6



7. What is restriction endonuclease ? Differentiate between blunt ends and sticky ends. Name one blunt end generating RE and one sticky end generating RE. What is the characteristic of DNA segment recognized by restriction endonucleases ? What do you mean by restriction mapping ? RFLP provides markers for characterizing genes. Explain.
- 2 + 2 + 2 + 2 + 3 + 4
8. Describe the structure of siRNAs and mention its prospective therapeutic applications and challenges. Compare siRNAs with miRNAs.
- 3 + 7 + 5
9. What is Ribozyme ? Describe with diagram the method of self-excision and splicing in Tetrahymena pre-ribosomal RNA.
10. What are the recent developments in Gene Therapy ? Discuss its problems.
- 7 + 8

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