



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech/BT (NEW)/SEM-6/BT-601/2013

2013

RECOMBINANT DNA TECHNOLOGY

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) Enzyme which is ribonucleic acid in nature is called
 - a) RNA
 - b) DNA
 - c) Ribozyme
 - d) RNase.
 - ii) The fluorescent dye used to detect DNA band by UV transilluminator is
 - a) Ethidium bromide
 - b) SyBR green
 - c) Methylene blue
 - d) Fluorescein.
 - iii) Which of the following enzymes is not used in cloning ?
 - a) Peptidyl transferase
 - b) DNA polymerase
 - c) DNA ligase
 - d) Reverse transcriptase.
 - iv) The polylinkers in pUC8 and pUC9 are
 - a) the same
 - b) inverted in orientation
 - c) different in sizes
 - d) none of these.



- xi) To be a cloning vector, a plasmid does not require
- origin of replication
 - a restriction site
 - an antibiotic resistant marker gene
 - to have a high copy member.
- xii) Two plasmids are of the same compatibility group if they
- can co-exist in the same bacterial cell
 - carry the same antibiotic gene
 - carry the same toxin gene.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- What are the differences between a genomic library and a cDNA library ?
- Elucidate any one method of studying expression of a gene.
- What is adaptor and linker ?
 - Describe the use of these in *r*DNA technology. $2 + 3$
- Write short notes on any *one* of the following :
 - Blue white screening
 - Nested PCR
 - Colony hybridization.
- What is GMT ? Describe briefly.



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Describe radio labelling of DNA at 5' end, 3' end and internal base of a DNA.
b) Describe the steps of western blotting techniques with diagram, and write its application and disadvantages.
c) Write the differences between Southern blotting, Northern blotting and Western blotting. $6 + 6 + 3$
8. a) Describe DNA sequencing by chain termination method, with diagram.
b) Describe the pyrosequencing methods of DNA with diagrams. Why is this method called pyrosequencing ?
c) What are the differences between Sanger dideoxy methods and pyrosequencing methods.
d) Based on which important enzymatic reaction are the above methods developed ? Write that reaction.
e) Starting with 600 template DNA molecules, after 25 cycles of PCR, how many molecules of DNA will be produced ? $5 + 4 + 2 + 2 + 2$
9. Discuss the role of HEPA filter in BSC. Describe different types of BSC and their uses. $3 + 12$
10. Write short notes on any *three* of the following : 3×5
 - a) Expression vectors
 - b) Retrovirus delivery system
 - c) Production of insulin
 - d) Applications of human genome project
 - e) Principle of DNA microarray.
11. Describe three methods of selecting a particular recombinant bacterium. Briefly mention the pros and cons of the methods. How can one use PCR in the selection process ? $9 + 3 + 3$