



Name :

Roll No. :

Invigilator's Signature :

CS/B.SC(H)MICRO.BIO/BT/GENT/MOL.BIO/SEM-5/RDT-502/2012-13

2012

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) Which of the following is a yeast plasmid that has a section of eukaryotic centromere ?

- | | |
|--------|---------|
| a) YEp | b) YRp |
| c) YCp | d) pUC. |

ii) Spheroplast lacks which of the following cellular components ?

- | | |
|---------------------|------------------|
| a) ER | b) Ribosome |
| c) Intact cell wall | d) Cytoskeleton. |



- iii) The virulent strain of pneumococcus, which was used in Griffith's discovery of transformation in 1928 was
- S strain
 - R strain
 - V strain
 - none of these.
- iv) Bacterial conjugation was first demonstrated by
- Griffith
 - Harshlay and Chase
 - Lederberg and Tatum
 - Mendel and Hige.
- v) The process in which bacterial DNA is transferred from one bacterial strain to another mediated by phage is known as
- Transformation
 - Conjugation
 - Transduction
 - None of these.
- vi) Emphysema is respiratory complication that results from the deficiency of
- Lactoferrin
 - α -1 antitrypsin
 - Tissue plasminogen activator
 - none of these.
- vii) Human lactoferrin is involved in the absorption of the following metal in the intestine.
- Zinc
 - Iron
 - Copper
 - Calcium.



- viii) T-DNA complex includes
- a) T-DNA, Vir D2 and Vir E2
 - b) T-DNA and VirG
 - c) T-DNA, Vir B and Vir E
 - d) T-DNA and Vir B.
- ix) Opine produced by plants are result of
- a) a result of wound
 - b) normal seasonal activity
 - c) agroinfection
 - d) none of these.
- x) Octopine and Nopaline type of plasmids differ in their
- a) organization of the vir region
 - b) organization of the T-DNA and Vir region
 - c) organization of the T-DNA
 - d) all of these.
- xi) The efficiency of PEG enhances in the presence of
- a) Magnesium
 - b) Calcium
 - c) Iron
 - d) Phosphorus.
- xii) Polymerase chain reaction was developed so that scientists could
- a) compare the DNA fingerprints of different people
 - b) create corn plants that produce Bt toxin
 - c) replicate a gene without using bacteria
 - d) choose organisms with desired characteristics for breeding.



GROUP - B

(Short Answer Type Questions)

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

2. Explain the process by which *B. subtilis* bind and take up free DNA.
3. Define competency. Name two gram-positive and gram-negative bacteria which encode the capacity or natural transformation.
4. Write short note on co-integrate vector mediate in gene transfer.
5. Briefly discuss the method of DNA microinjection in oocytes.
6. Discuss how embryonic stem cells are processed for gene transfer.

GROUP - C

(Long Answer Type Questions)

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

7. How are plant viruses used as vectors ? What are the major applications of these gene transfers ? $12 + 3$
 8. Explain the PCR based site directed mutagenesis. Write briefly the gapped duplex method. Write the applications of site directed mutagenesis. $6 + 5 + 4$
 9. Write short notes on any *three* : 3×5
 - i) Dolly, the cloned sheep
 - ii) Transgenic mice
 - iii) Therapeutic proteins
 - iv) Binary vector.
 10. Discuss how transgenic animals can be used for improvement of dairy, wool and fiber industries. Discuss two biopharmaceutical applications of transgenic goat. $12 + 3$
 11. What is gene targeting ? Discuss in detail the methods used for gene targeting. $3 + 12$
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