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| 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.

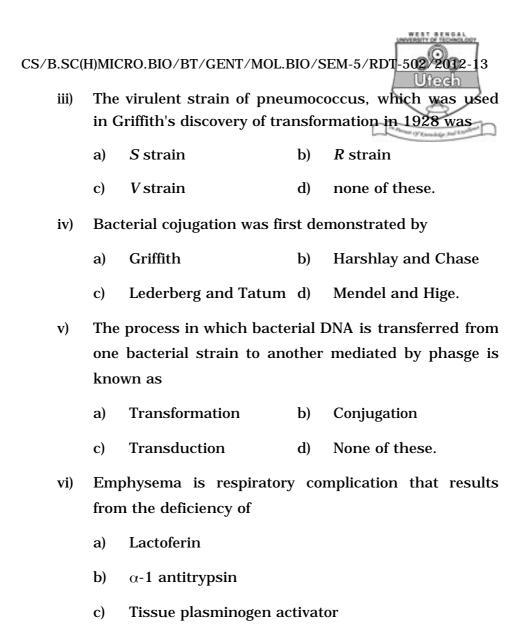
## **GROUP** – A

## (Multiple Choice Type Questions)

- 1. Choose the correct alternatives for any *ten* of the following :  $10 \times 1 = 10$ 
  - 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.

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- d) none of these.
- vii) Human lactoferin is involved in the absorption of the following metal in the intestine.
  - a) Zinc b) Iron
  - c) Copper d) Calcium.

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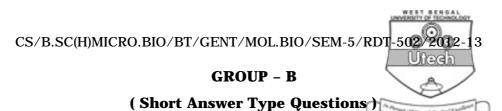


- viii) T-DNA complex includes
  - a) T-DNA, Vir D2 and Vir E2
  - b) T-DNA and VirG
  - c) T-DNA, Vir B and Vir E
  - d) T-DNA and Vir B.
- ix) Opine produced by plants are result of
  - a) a result of wound
  - b) normal seasonal activity
  - c) agroinfection
  - d) none of these.
- x) Octopine and 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.

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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 gramnegative 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.  $3 \times 15 = 45$ 

- 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* :  $3 \times 5$ 
  - 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