



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (BT)/SEM-4/BT-402/2010**

**2010**

**INDUSTRIAL MICROBIOLOGY AND  
ENZYME TECHNOLOGY**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

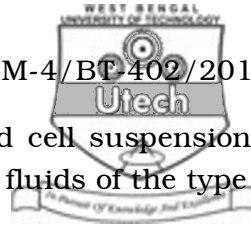
*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A  
( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) Enzyme used in biopolishing of cotton is
    - a) amylase
    - b) cellulase
    - c) alkaline protease
    - d) lipase.
  - ii) Taq polymerase is isolated from
    - a) *Mucor micheli*
    - b) *Bacillus licheniformis*
    - c) *Thermus aquaticus*
    - d) *E.Coli*.
  - iii) The equation of motion of Newtonian fluid is known as
    - a) Arrhenius equation
    - b) Avogadro's equation
    - c) Navier-Stokes equation
    - d) Momentum transfer.



- iv) The moisture level of SSF is
- a)  $30\% \pm 5\%$                       b)  $42\% \pm 5\%$   
c)  $40\% \pm 5\%$                       d)  $45\% \pm 5\%$ .
- v) Stability of enzyme activity means preservation of its
- a) structure                              b) activity  
c) pH                                        d) none of these.
- vi) Citric acid is produced by
- a) *Aspergillus niger*  
b) *Candida utilis*  
c) *Trichoderma utilis*  
d) *Saccharomyces cerevisiae*.
- vii)  $\beta$ -amylase can hydrolyse starch to produce
- a) glucose & maltose              b) glucose  
c) lactose                                d) maltose.
- viii) Commercial Streptomycin production is carried out by using
- a) *S.aureus*                              b) *S.griseus*  
c) *S.pyogenes*                        d) *Streptococcus*.
- ix) The cutting site for  $\alpha$ -anylase on the starch is
- a)  $\alpha$ -1, 4 glycosidic bond  
b) amide bond  
c)  $\alpha$ -1, 6 glycosidic bond  
d) diester bond.
- x) Frameshift mutagens intercalate into the DNA molecule and cause errors which result in
- a) formation of cross-links  
b) formation of dimmers  
c) alteration of reading frame  
d) changes in bases.



- xi) Rheological behaviour of concentrated cell suspensions is given by the type of non-Newtonian fluids of the type
- a) Bingham plastic
  - b) Dilatant
  - c) Pseudoplastic
  - d) Thixotrophy.
- xii) Acetic acid production is rather than a true fermentation of
- a) an incomplete oxidation
  - b) a complete oxidation
  - c) an oxidative process
  - d) an aerobic condition.

**GROUP – B**

**( Short Answer Type Questions )**

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

2. What are the significances of trophic phase and idio phase in citric acid production ?
3. Differentiate between spontaneous and induced mutations. What are transition and transversion ?  $2 + 3$
4. Write short notes on the microbial synthesis of the polysaccharides, Dextran and Xanthan.
5. Describe the following :
  - a) Feedback inhibition
  - b) Concerted inhibition.  $2 \frac{1}{2} + 2 \frac{1}{2}$
6. Describe the control pathways of Arginine synthesis from Glutamate by *Corynebacterium glutamicum*.

CS/B.Tech (BT)/SEM-4/BT-402/2010



**GROUP – C**

**( Long Answer Type Questions )**

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

7. What are broad spectrum and narrow spectrum antibiotics ?  
Draw a schematic for streptomycin production. Mention one strain involved in this production.  $4 + 10 + 1$
8. Using Navier-Stokes equation, derive the expression for velocity distribution for a flow down an inclined plane. What will be the average velocity in this case ?  $10 + 5$
9. Name the organism for production of citric acid. What are the basic raw materials used in the production ? Schematically write the flow-chart for its production and recovery.  $2 + 6 + 7$
10. How are cellular controls regulating production of microbial primary metabolites governed ? State an example of a fermentation process to elucidate the process.  $8 + 7$
11. What do you understand by a strain development program ? Define with a specific example, the use of recombinant DNA technology and Genetic engineering in strain development programs. Elucidate with a specific example.  $4 + 6 + 5$

=====