Printed Pages : 2 EBT601

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2444 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-VI) THEORY EXAMINATION, 2012-13

FERMENTATION BIOTECHNOLOGY

Time : 3 Hours] *[Total Marks : 100*

SECTION – A

1. Attempt **all** question parts : **10 × 2 = 20**

   (a) How to minimize lag phase in industrial fermentations ?

   (b) What are secondary metabolites ? Give two examples.

   (c) Write short notes on Xanthan gum.

   (d) Give Monod equation.

   (e) Explain the methods for maintaining microbial strains.

   (f) Write on biotransformation and any two products produced by this process.

   (g) Name few precursors used in antibiotic production and its effect.

   (h) Why continuous cultivation of metabolites is not preferred in the industries ?

   (i) What are anti-foaming agents ? Mention its function in gas transfer in reactors.

   (j) What are the desirable physiological properties of industrial yeast strains ?

SECTION – B

2. Attempt any **three** question parts : **3 × 10 = 30**

   (a) Discuss briefly on the following :

      (i) Compare and summarize the solid state fermentation and submerged liquid fermentation.

      (ii) What are the processes involved in the separation of an intracellular primary metabolite during product recovery ?

   (b) Elaborate the applications of solid state fermentation to food industry with examples.

   (c) Explain in detail the general production steps involved in the SSF process of Citric acid.

(d) Write the importance of inoculum development and basic steps involved in it. Discuss the different stages in fermentative production of Penicillin.

(e) What are the practical issues of brewing ? Elaborate the biotechnological approaches used to reduce the alcoholic content and acidity of wine ?

SECTION – C

Attempt **all** questions : **5 × 10 = 50**

3. Attempt any **two** parts : **2 × 5 = 10**

(a) What is nutrient repression ? Explain with suitable examples.

(b) List the plant secondary metabolites produced using cell culture. What are the advantages and disadvantages in using plant cell culture for producing secondary metabolites ?

(c) Elaborate the various ways in the pretreatment of raw materials.

4. Attempt any **one** part : **1 × 10 = 10**

(a) List the pectinase producing microorganisms. What are the substrates and steps employed in the pectinase production ? Mention the application of pectinase in various industries.

(b) What is single cell protein ? What are the limitations of using single cell proteins as a food product ? Illustrate the production process of single cell protein with the help of flow chart.

5. Attempt any **one** part : **1 × 10 = 10**

(a) What are probiotics ? Explain the role of lactic acid bacteria as probiotics. Give the generalized flow chart for the production of the probiotic yoghurt.

(b) What is bioreactor ? Explain in detail about the different types of bioreactor for solid state fermentation.

6. Attempt any **one** part : **1 × 10 = 10**

(a) Discuss in detail about the production process of Beer, indicating substrates, microorganisms used and fermentation conditions.

(b) What is recombinant DNA (rDNA) technology ? How rDNA technology is utilized for the production of any viral vaccine.

7. Attempt any **two** part : **2 × 5 = 10**

(a) Discuss the criteria used for the raw materials for fermentation ?

(b) Explain the procedures involved in the overproduction of metabolites.

(c) Describe the major steps and parameters involved in scale up of fermentation.