

**MAY 2011**

**[KY 357]**

**Sub. Code: 2918**

**M.PHARM. DEGREE EXAMINATION**

**(Regulations 2010)**

**(Candidates admitted from 2010-2011 onwards)**

**FIRST YEAR**

**BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY**

**PAPER III – BIOPROCESS TECHNOLOGY**

*Q.P. Code : 262918*

**Time : Three hours**

**Maximum : 100 marks**

**Answer All questions**

**I. Essay Questions :**

**(6 x 10 = 60)**

1. Explain the downstream processing of extra cellular product.
2. Discuss in detail about the basic principles of fermentation.
3. Explain the primary and secondary screening techniques.
4. Describe in detail the fermentative production and recovery of Alcohol.
5. Explain the thermal death kinetics.
6. Explain the computer control of fermentation process: system configuration and application.

**II. Write Short Notes :**

**(8 x 5 = 40)**

1. Measurement of mass transfer coefficient.
2. Bio- autography.
3. HTST - Sterilization.
4. Maintenance of stock cultures.
5. Fermentative production of Penicillin.
6. Microbial transformation of steroids.
7. Explain the operation of air- lift bio-rectors.
8. Metabolic response assay.

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October 2011

[KZ 357]

Sub. Code: 2918

**M.PHARM. DEGREE EXAMINATION**

**FIRST YEAR**

**BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY**

**PAPER III – BIOPROCESS TECHNOLOGY**

*Q.P. Code : 262918*

**Time : 3 hours  
(180 Min)**

**Maximum : 100 marks**

**Answer ALL questions in the same order.**

**I. Elaborate on :**

|   | <b>Pages<br/>(Max.)</b> | <b>Time<br/>(Max.)</b> | <b>Marks<br/>(Max.)</b> |
|---|-------------------------|------------------------|-------------------------|
| 1. Explain mass transfer theory and oxygen transfer system.   | 17                      | 40                     | 20                      |
| 2. (a) Michaelis Menton constant                              |                         |                        |                         |
| (b) Preparation of fine chemical by using immobilized system. | 17                      | 40                     | 20                      |

**II. Write notes on :**

|  |   |    |   |
|--|---|----|---|
| 1. Outline about closed fermentation system                      | 4 | 10 | 6 |
| 2. Line weave – burke plot                                       | 4 | 10 | 6 |
| 3. Application of bioreactor                                     | 4 | 10 | 6 |
| 4. Importance of aeration and agitation                          | 4 | 10 | 6 |
| 5. Measurement of mass transfer coefficient                      | 4 | 10 | 6 |
| 6. Outline about cleaning and sterilization of air               | 4 | 10 | 6 |
| 7. Briefly about biomass   | 4 | 10 | 6 |
| 8. Write brief discussion about Anti foaming agent with examples | 4 | 10 | 6 |
| 9. Maintenance of stock culture                                  | 4 | 10 | 6 |
| 10. Design and types of impeller                                 | 4 | 10 | 6 |

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[LA 357]

MAY 2012

Sub. Code: 2918

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY

PAPER III – BIOPROCESS TECHNOLOGY

*Q.P. Code: 262918*

**Time: 3 hours**  
**(180 Min)**

**Maximum: 100 marks**

**Answer ALL questions in the same order.**

**I. Elaborate on:**

**Pages    Time    Marks**  
**(Max.)   (Max.)   (Max.)**

- |  |    |    |    |
|--|----|----|----|
| 1. (a) Design and operation of large scale fermentor and its application.            |    |    |    |
| (b) HTST Sterilization-Advantage and disadvantage.                                   | 17 | 40 | 20 |
| 2. Define biotransformation and explain biotransformation of steroids and alkaloids. | 17 | 40 | 20 |

**II. Write notes on:**

- |   |   |    |   |
|---|---|----|---|
| 1. Single cell protein                              | 4 | 10 | 6 |
| 2. Thermal death kinetics                           | 4 | 10 | 6 |
| 3. Theory of chromatography separation              | 4 | 10 | 6 |
| 4. Differentiate downstream and upstream processing | 4 | 10 | 6 |
| 5. Equipment and design of solvent extraction       | 4 | 10 | 6 |
| 6. Computer application in bioprocessing            | 4 | 10 | 6 |
| 7. Explain cyclic AMP-Fermentation process          | 4 | 10 | 6 |
| 8. Metabolic response assay                         | 4 | 10 | 6 |
| 9. Packed bed fermentor                             | 4 | 10 | 6 |
| 10. Primary and secondary screening                 | 4 | 10 | 6 |

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[LB 357]

NOVEMBER 2012  
M.PHARM. DEGREE EXAMS  
FIRST YEAR

Sub. Code: 2918

BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY  
PAPER III – BIOPROCESS TECHNOLOGY  
Q.P. Code : 262918

Time : 3 hours  
(180 Min)

Maximum : 100 marks

Answer ALL questions in the same order.

**I. Elaborate on :**

|   | Pages<br>(Max.) | Time<br>(Max.) | Marks<br>(Max.) |
|---|-----------------|----------------|-----------------|
| 1. Explain the various techniques used in scale up of fermentation.                         | 17              | 40             | 20              |
| 2. Describe in detail the fermentation production of<br>(i) Streptomycin (ii) Vitamin B 12. | 17              | 40             | 20              |

**II. Write notes on :**

|  |   |    |   |
|--|---|----|---|
| 1. Rheological properties of fermentation system.                | 4 | 10 | 6 |
| 2. Role of computer in controlling fermentation process.         | 4 | 10 | 6 |
| 3. Continuous culture method.                                    | 4 | 10 | 6 |
| 4. Design of a Bioreactor.                                       | 4 | 10 | 6 |
| 5. Principles of downstream process.                             | 4 | 10 | 6 |
| 6. Factors affecting mass transfer coefficient.                  | 4 | 10 | 6 |
| 7. Strain improvement techniques.                                | 4 | 10 | 6 |
| 8. Regulations governing the manufacture of biological products. | 4 | 10 | 6 |
| 9. Immobilization and its applications.                          | 4 | 10 | 6 |
| 10. Microbial production of alcohol.                             | 4 | 10 | 6 |

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[LC 357]

APRIL 2013

Sub. Code: 2918

M.PHARM. DEGREE EXAMS

FIRST YEAR

BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY

PAPER III – BIOPROCESS TECHNOLOGY

*Q.P. Code : 262918*

**Time : 3 hours**

**Maximum : 100 marks**

**I. Elaborate on :**

**(2x20=40)**

1. Explain about different type of cultivation system with graphical representation
2. Write detail about theory, design, operation & recovery of following downstream process
  - a. Solvent extraction
  - b. Chromatographic separation

**II. Write notes on :**

**(10x6=60)**

1. Maintenance of stock cultures
2. Brief notes on Supply of air
3. Briefly about D value & Z value
4. Production and purification of penicillin
5. outline about liquid sterilization techniques
6. Discuss about different type of immobilization method
7. Steroid bio transformation
8. Design & operation hollow fibre bioreactor
9. Briefly about different type of impeller
10. Theory of fermentation process

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[LD 357]

OCTOBER 2013

Sub. Code: 2918

**M.PHARM. DEGREE EXAMINATIONS**

**FIRST YEAR**

**BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY**

**PAPER III – BIOPROCESS TECHNOLOGY**

*Q.P. Code : 262918*

**Time: Three Hours**

**Maximum: 100 marks**

**Answer ALL questions in the same order.**

**I. Elaborate on :**

**(2 x 20 = 40)**

1. Explain the various systems of cultivation and their merits and demerits.
2. Discuss in detail about the design of bio reactor and uses of Computers in fermentation.

**II. Write notes on :**

**(10 x 6 = 60)**

1. Cleaning & sterilization of air.
2. Extraction methods .
3. Fermentation kinetics.
4. Air lift fermentor .
5. Preservation of microbial culture.
6. Bioprocessing of alcohol .
7. Microbial transformation.
8. Enzyme assays.
9. Importance of rheology.
10. Bio mass estimation.

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[LE 357]

APRIL 2014

Sub. Code: 2918

**M.PHARM. DEGREE EXAMS  
FIRST YEAR  
BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY  
PAPER III – BIOPROCESS TECHNOLOGY**

*Q.P. Code : 262918*

**Time : 3 hours**

**Maximum : 100 marks**

**I. Elaborate on :**

**(2x20=40)**

1. Explain the following microbial metabolites.
  - a) Vitamin B12 and Riboflavin.
  - b) Glutamic acid and Lysine.
2. Detail discussion about rheological properties of fermentation systems and its importance.

**II. Write notes on :**

**(10x6=60)**

1. Merit and demerit of HTST Sterilization
2. Application of bioreactor
3. Importance of aeration & agitation
4. Design & operation of bubble column fermentor
5. Outline about closed fermentation system
6. Advantage of bio transformation
7. Theory of downstream process
8. Brief notes on cleaning and sterilization of air
9. Application of air lift fermentor
10. Importance of pH & temperature control knob in fermentor

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[LF 357]

OCTOBER 2014

Sub. Code: 2918

**M.PHARM. DEGREE EXAMINATION  
FIRST YEAR  
BRANCH VI – PHARMACEUTICAL BIOTECHNOLOGY  
PAPER III – BIOPROCESS TECHNOLOGY**

*Q.P. Code : 262918*

**Time : Three hours**

**Maximum : 100 marks**

**I. Elaborate on:**

**(2x20=40)**

1. Write detail about biosynthesis of secondary metabolites and its importance.
2. Define bioreactor and explain different types of bioreactor.

**II. Write notes on:**

**(10x6=60)**

1. Discuss about strain improvement for increased yield.
2. Alkaloid biotransformation.
3. Briefly about different type of sparger.
4. Production of lactic acid.
5. Measurement of mass transfer coefficient.
6. Application of semi open system.
7. Briefly about air compressing system.
8. Define microbial transformation and explain with example.
9. Explain the methods of cell disruption.
10. Compare the efficacy of immobilized and free cells.

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