

**M. TECH. –III (CHEMICAL) (2011COURSE) CHOICE BASED
CREDIT SYSTEM : WINTER - 2017
SUBJECT : ELECTIVE – II: b) BIOPROCESS ENGINEERING**

Day : **Thursday**
Date : **18/01/2018**

Time : **11.00 AM TO 02.00 PM**
Max. Marks : 60

W-2017-3210

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer books.

SECTION – I

Q.1 Explain types and structure of cells. **[10]**

OR

Explain growth kinetics of cells.

Q.2 Give details of Michaelis – Menten kinetics for enzymes. **[10]**

OR

What are the factors influencing enzyme activity? Give suitable example.

Q.3 What are scale up difficulties for Bioreactor? **[10]**

OR

Give instrumentations and control for bioreactor.

SECTION – II

Q.4 What is meant by cell disruption? Give methods of cell disruption. **[10]**

OR

Which are the finishing steps for purification of enzymes? Explain with example.

Q.5 How single cell protein is produced? Give details. **[10]**

OR

Explain in detail production of penicillin.

Q.6 How microbes are used in oil recovery and mineral beneficiation? **[10]**

OR

Give any one medical application of bioprocess engineering.

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