

**M. TECH. –III (CHEMICAL ENGINEERING) (CBCS – 2015
COURSE) : WINTER - 2017
SUBJECT : ELECTIVE – II: BIOPROCESS ENGINEERING**

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

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

W-2017-2972

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 the separate answer books.

SECTION – I

Q.1 Explain the Michallis-Menten kinetics. **[10]**

OR

Q.1 Describe the types and structures of cells. **[10]**

Q.2 What are enzymes? Discuss various applications of enzyme. **[10]**

OR

Q.2 What is immobilized enzyme technology? **[10]**

Q.3 What are Bioreactors? Explain its applications. **[10]**

OR

Q.3 What are the scale-up difficulties for bioreactors? **[10]**

SECTION – II

Q.4 Explain different techniques for separation of enzymes. **[10]**

OR

Q.4 Describe different methods for purification of products with suitable example. **[10]**

Q.5 Draw the neat block diagram for production of acetone and explain the process parameters. **[10]**

OR

Q.5 Explain the production of HFCS (High Fructose Corn Syrup). **[10]**

Q.6 Write short notes on: **[10]**

- a) Medical applications of bioprocess engineering
- b) Stem cell

OR

Q.6 Write short notes on: **[10]**

- a) Biofertilizers and biopesticides
- b) Role of microbes in industrial waste water treatment

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