

Registration No.

--	--	--	--	--	--	--	--	--	--

Total number of printed pages - 02

**B.TECH**  
**PCCH4402**

**7<sup>th</sup> Semester Regular / Back Examination 2016-17**  
**FUNDAMENTALS OF BIOCHEMICAL ENGINEERING**  
**BRANCH : Chemical**

**Time : 3 Hours**

**Max Marks : 70**

**Question Code : Y251**

**Answer Question No. 1 which is compulsory and any FIVE from the rest.**

**The figures in the right-hand margin indicate marks.**

**Answer all parts of a question at a place.**

1. **Answer the following questions :** **2 x 10**
- (a) What is enzyme specificity? What are the various types of enzyme specificity?
  - (b) What is magma?
  - (c) Define thermal diffusivity.
  - (d) What is Malthus' Law?
  - (e) With some examples define critical parameter of a fermentation process.
  - (f) Define Fick's law of diffusion.
  - (g) What do you mean by "inactivation factor"? Give an expression for it.
  - (h) Write some applications of mass transfer in bio-processing.
  - (i) Find the g-number of a centrifuge with an effective radius of 10cm and rotating at a speed of 30rps.
  - (j) What do you mean by growth-associated product formation in fermentation process?
2. (a) Briefly explain the different methods of air sterilization. **05**
- (b) Describe the process of continuous sterilization. **05**
3. (a) What are the various parameters that can be controlled for the successful operation of a fermenter? **04**
- (b) Briefly explain the factors affecting oxygen transfer rate in a fermentation process. **06**

- 210 210 210 210 210 210 210 210
4. Describe briefly the concept of design of a fermenter. What are the factors that you consider as essential for successful design and operation of a fermenter? 10
5. Explain in details the production of biogas and the factors affecting methane formation. 10
6. (a) Explain how Michaelis-Menten equation can be derived for enzymatic kinetics from first principles. 07
- (b) What are the various industrial applications of enzymes? 03
7. What are the various effluent treatment methods? Describe them briefly. 10
8. **Write short notes on any TWO:** 5 x 2
- (a) Tubular bowl centrifuge
- (b) Chromatography
- (c) Methods of cell disruption
- (d) Enzyme immobilization
- 
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210
- 210 210 210 210 210 210 210 210