

## **V SEMESTER B.TECH. (CHEMICAL ENGINEERING)**

### **END SEMESTER EXAMINATIONS, NOVEMBER 2017**

# SUBJECT: INTRODUCTION TO BIOCHEMICAL ENGINEERING Program Elective –I [CHE 4018]

### REVISED CREDIT SYSTEM (22/11/2017)

Time: 3 Hours

MAX. MARKS: 50

### Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitably assumed.

1A.	Discuss about the appendages in bacterial cell structure.	3
1B.	Write a short note on Haworth Projection with an example.	3
1C.	Discuss about semi-conservative replication of DNA strands with a pictorial representation.	4
2A.	Derive an expression to determine the enzyme kinetics for the following reaction: $E + S \rightleftharpoons ES \rightleftharpoons E+P$ where, $E - Enzyme$ ; $S - Substrate$ ; $P - Product$	8
2B.	Write a short note on cooperative binding.	2
3A.	Derive an expression to study the effects of solute diffusion on the kinetics of immobilized enzymes.	7
3B.	Write a short note on different types of inhibitors which affect the enzymatic actions.	3
4A.	Explain the metabolic pathway which results in the formation of pyruvates from a glucose molecule.	6
4B.	Discuss about the synthesis of ATP molecules by electron transport chain.	4

5A.	Discuss about various phases involved in cell growth.	3
5B.	Derive an expression to determine the reaction time required for a single cell- substrate system in a batch bioreactor, if the kinetics of substrate consumption follows Michaelis-Menten equation.	5
5C.	Write a short note on symbiotic and prey-predator systems.	2

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