



University of Technology
Department of Applied Sciences
Final Examination 2015/2016



Subject : E nzyme biotechnology
Branch : Biotechnology
Examiner : Dr. Entesar H. Ali

Class : 4th year
Time : 3 hours
Date : 2015- 2016

ANSWER ONLY (4) QUESTIONS

Q1 (25 marks)

A- Why used solubilization method in bioseparation ? (12.5 marks)

B- What the salting out mean? (12.5 marks)

Q2 (25 marks)

A- How can PH effect in activity of enzyme ? (12.5 marks)

B- How you can purification protein have positive charge ? (12.5 marks)

Q3 (25 marks) (Answer only 3)

A- What the capacity and porosity mean ? (12.5 marks)

B- What zwitter ionic mean ? (12.5 marks)

Q4 (15)

A- What the apoenzyme and holoenzyme mean? (5 marks)

B- How can purity immunoglobulin in solution ? (5 marks)

Q5 (15)

A- Why enzyme have specificity ? (12.5 marks)

B- Why used toluene ? (12.5 marks)

Dr. Entesar H. Ali



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Subject: Bioreactors

Class: 4th year

Branch: biotechnology

Examiner: Assist. Prof. Dr. Amal Ali Hussein

Time: 3 hours

Date: 2016

Note: Answer on Four questions (Each question 25 marks)

Q1. A. What is fermentation? State the major groups of commercially fermentation.

B. Define tower fermenter.

Q2. A. What are the difference between Solid substrate fermentation and liquid fermentation.

B. How can measure the temperature of fermenter?

Q3. Compare microbial growth in batch and continuous culture. Give the equations and show the differences between the two.

Q4. Explain by drawing only

1. The types of impeller (agitator)

2. Thy typical stirred tank reactor.

Q5. A. What are the characteristic of semiconteneous culture?

B. State the types of sparger.

Good luck

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