Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER III
SESSION 2013/2014

COURSE NAME	:	FERMENTATION TECHNOLOGY
COURSE CODE	:	DAK 20303
PROGRAMME	:	1 DAK
EXAMINATION DATE	:	AUGUST 2014
DURATION	:	2 1/2 HOURS
INSTRUCTION	:	A) ANSWER **ALL** QUESTIONS IN SECTION A
		B) ANSWER **TWO (2)** FROM FOUR (4) QUESTIONS IN SECTION B

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

SECTION A

Q1 (a) Solid-state fermentation is fermentation of solid substrates at low moisture levels or water activities.

(i) Identify major advantages of solid-state fermentation over submerged fermentation systems.

(5 marks)

(ii) List the product of fermentation that using solid-state fermentation methods.

(3 marks)

(b) Write the advantages and disadvantages of using batch and continuous bioreactor.

(12 marks)

Q2 Microbes are being used for industrial production of pharmaceuticals, chemical and food production. Each of this process has unique characteristics in terms of variables and operation condition.

BEBAS

(a) Sketch industrial ~~bioethanol production/ or penicillin production/ or lactic acid~~ BIOETHANOL/ CITRIC ACID production flow work until downstream processing.

(12 marks)

(b) Analyze type of recovery and purification step suitable with that chosen industrial fermentation production.

(8 marks)

SECTION B

Q3 Fermentation is a process for the production of product by the mass culture of microorganism.

(a) Define fermentation of food.

(2 marks)

(b) Identify the advantages of food fermentation.

(10 marks)

(c) Write details production of two chosen fermented foods.

(8 marks)

Q4 Enzymes are proteins that catalyze chemical reactions.

(a) Explain mechanism of enzymes.

(6 marks)

(b) Predict the effect of using enzymes outside its optimum temperature.

(4 marks)

(c) Write the properties of enzymes.

(10 marks)

Q5 (a) Bioreactor is a vessel which is used to perform biochemical reactions. A large number of bioreactor designs are available to satisfy different diversity of substrate, microbes and product.

(i) Sketch different type of bioreactor.

(8 marks)

(ii) Relate the bioreactor with suitable fermentation product.

(6 marks)

(b) The maintenance of optimal conditions for product formation in a bioreactor requires control and measurement of operation condition. List the control parameter in a bioreactor with suitable measuring devices.

(6 marks)

Q6 (a) Fill blanks with appropriates word.

During batch fermentation, microbial population exhibits several different growth phases. The _____ phase occurs immediately after inoculation and is a period of adaptation of microbes to a new environment. Cell replication is maximal during _____ phase. Depletion of one or more essential nutrient or accumulation of toxic by-product causes _____ phases. In the _____ phases, there is no net growth. The _____ phase follows when cells can no longer obtain enough energy from their reserves or enough of another critical resource.

(5 marks)

(b) Write the detail steps for microbes' isolation in order to obtain single culture in the form of single colony.

(15 marks)

- END OF QUESTION -