FEDERAL UNIVERSSITY OF TECHNOLOGY, OWERRI
SCHOOL OF HEALTH TECHNOLOGY
DEPARTMENT OF BIOMEDICAL TECHNOLOGY
2011/2012 HARMATTAN SEMESTER EXAMINATION

COURSE: BIOPROCESS TECHNOLOGY **COURSE CODE: BMT 553; Unit: 2**

Instruction: Answer any two questions in section A

In section B, answer all questions in part I and any one question in part II **Time: 1hrs**

Section A

1(a) Distinguish between bioprocessing and chemical processing

(b) Briefly explain any three methods for each of viable and total count methods.

(c) What do you understand by each of the following?

(i) Fermentation medium
(ii) Cell culture
(iii) Inoculums development
(iv) Isolation of microbial cells
(v) Aseptic transfer

(d) Outline factors affecting each of the growth phases of microbial cells.

(Total: 20marks)

2(a) Briefly explain microbial growth kinetics of a bioprocess

(b)Distinguish between ***iodophase*** and ***trophophase***

(c) Outline product classification of bioprocess with examples

(d) State 5 features of microbes responsible for industrial applications

(e) State 5 microorganisms and their applications

(Total: 20marks)

3(b) Briefly explain the two section of bioprocess

(b) The table below shows the experimental results of Bioproduction kinetics of butanediol from cheese whey by the inoculation of klebsiellasp under aerated and unaerated conditions based on the elementary equation below.

$$C \xrightarrow{X} P + X(enmasse)$$

Time (hr)	C_1(mg/L)	X_1(mg/L)	P_1(mg/L)	C_2(mg/L)	X_2(mg/L)	P_2(mg/L)
0	29	0	0	29	0	0
12	24.5	0.3	1.6	25.2	0.5	1.9
24	21.5	0.5	3.1	22.1	0.9	3.7
36	18.5	0.7	5.0	15.9	1.7	7.2
48	11.0	1.2	6.8	9.8	2.5	10.6
60	3.5	1.7	8.3	2.8	3.4	14.2
72	1.2	1.8	9.8	1.7	3.5	17.8
84	0.5	1.9	10.6	1.3	3.6	17.8
96	0.5	1.9	10.6	1.3	3.6	17.8

Note: subscript 1 means for unaerated condition while subscript 2 means aerated condition.

(i) Determine the yield of the klebsiellasp on cheese whey under aerated condition.

(ii) Determine the maximum specific growth rate and saturation coefficient under unaerated condition. Hence make assertions.

(Total: 20marks)