FEDERAL UNIVERSSITY OF TECHNOLOGY, OWERRI
SCHOOL OF HEALTH TECHNOLOGY
DEPARTMENT OF BIOMEDICAL TECHNOLOGY
2012/2013 HARMATTAN SEMESTER EXAMINATION

COURSE: BIOPROCESS TECHNOLOGY **COURSE CODE: BMT 553**

Instruction: Answer 1 &any other three in section A **Time: 2hrs**

Section A

1(a) The table below shows the experimental results of bio-production of prednisolone from cheese whey by the activity *arthrobacter simplex* in a batch reactor at room temperature based on the elementary equation below.

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

Where C is the concentration of cheese whey, X represent biomass concentration of arthrobacter simplex and P is th prednisolone concentration.

t(hr)	C (g/L)	X (mg/L)	P (g/L)
0	45.0	0.05	0
12	33.8	0.064	1.55
24	21.5	0.077	3.10
36	11.9	0.09	4.95
48	4.5	0.094	6.76
60	2.1	0.096	8.27
72	1.8	0.096	9.77

(i) Determine the yield of prednisolone from cheese whey.
(ii) Determine the maximum specific growth rate and Monod's kinetics constant.

(b)Justify bioprocess technology under the following:
(i) Name five (5) industrial microbes.
(ii) State two (2) organic chemical products for each in C (i) above.
(iii) State two (2) uses for each in C (ii) above.

(Total: 25marks)

2(a) Briefly explain microbial and product kinetics of bioprocess.
(b) Distinguish between upstream and downstream sections of bioprocess.
(c)Outline five stages involve in the downstream of bioprocessing.

(Total: 15marks)

3(a) What do you understand by bioprocess technology.
(b) Briefly explain four (4) ways of manipulating cell cultures.
(c) Outline four (4) classifications of microbial products during bioprocess with two examples for each.

(Total: 15marks)

4(a) Mention three industries where enzymes find application.
(b) Expalin two uses of enzymes in each of the industries mentioned in 4(a) above.
(c) Discuss in details microbial production of a named industrial enzyme.

(Total: 15marks)

5(a) Write short notes on the following: (i) Alkaloids is primary metabolite (ii) Penicillin.
(b) Discuss the production of a named secondary metabolite under the following headings:
(i)Micro-organism (ii) Growth (iii) Production process (iv) Optimization.

(Total: 15marks)

Prof. C.O. Ohaeri 08/03/13