



University of Technology
Department of Applied Sciences
Final Examination 2014/2015



Subject: Environmental Biotechnology

Class: 2nd yea

Branch: biotechnology

Examiner: Assist. Prof. Amal Ali Hussein

Time: 3 hours

Date:

Note: Answer on FOUR questions

Q1: (A) Assuming an exponential growth of a bacterial population with an initial number of cells $X_0 = 500$ cells/L and a specific growth rate $\mu = 0.5 \text{ h}^{-1}$, determine:

- (a) The cell concentration after 6 h
- (b) The doubling time t_d

(B) Why does methemoglobinemia affect mostly infants?

Q2: (A) Draw the flow chart of ecosystem divisions supporting your answers with examples

(B) Describe an activated sludge floc.

Q3:(A) Illustrate with microbial growth curve the kinetics of batch culture system.

(B) Mention in brief the main differenced of bioremediation process: Bioventing and Biosparging.

Q4: What is the principle behind enhanced biological phosphorus removal? How is it accomplished in wastewater treatment plants?

Q5: Choose the correct answer (Five only)

1-The release of excessive amounts of harmful substances such as car and factory fumes and tyre rubber into the atmosphere is called:

- a.Noise pollution
- b. mutagenic pollution
- c. air pollution.

2-When phosphate-containing wastes from detergents and fertilizers reach our waterways, water plants grow excessively extracting oxygen from the water causing fish to suffocate. This process is called:

- a.phosphatisation
- b. sewage recycling
- c. eutrophication.

3- Treatment of sewage involves:

- a. removal of suspended particles b. allow aeration for bacterial action c. removal of nitrates and phosphates d. all of these.

4- Air, oxygen levels, currents, temperature, moisture, soil, light and humidity are all example of ...

- a. Ecosystem b. Abiotic Factors c. Biotic Factors d. Commensalism.

5- What is the original source of almost all the energy in most ecosystems?

- a. Water b. Carbon c. Sunlight d. Carbohydrates

6- All the interconnected feeding relationships in an ecosystem make up a food

- a. web b. chain c. network d. interaction

Good Luck