BEL718

Department of Biochemical Engineering and Biotechnology

Minor Examination – I

30th August, 2014
13^{00}-14^{00} Hrs.
WS-209

Answer all questions. Maximum marks 20. All questions carry equal marks.

1. What do you understand from the BOD of a sample of wastewater? What are its potential applications for design of a biological wastewater treatment plant? What are the precautions one should take while analyzing a sample for its BOD?

   (4 marks)

2. Explain how the toxicity associated with a wastewater sample is estimated and expressed.

   (4 marks)

3. What do you understand by (i) Extended aeration process (ii) Contact stabilization process? Explain the situations where each of the two will find application.

   (4 marks)

4. In an activated sludge process using complete-mix aeration tank, show that the effluent substrate concentration "s" is given by the relation

$$s = \frac{K_s(1+k_d\,\theta_c)}{\theta_c(\mu_m - k_d) - 1}$$

   where K_s is the Monod constant, k_d is the endogenous decay rate constant, θ_c is the solids (cell) retention time and μ_m is the average maximum specific growth rate of the mixed aerobic culture used.
   The above expression seems to indicate that the substrate concentration in the treated effluent is independent of the influent substrate concentration as well as the MLVSS concentration !!! Is this possible? Why? Explain.

   (8 marks)