Code No: C5107 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Examinations March/April-2011
ADVANCED ENVIRONMENTAL ENGINEERING
(CHEMICAL ENGINEERING)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks

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1. As a Chemical Engineer, suggest the methods need to be followed to control pollution in process industries, explain with different examples. [12]

2. Derive the Atmospheric dispersion equation and its solutions by considering continuity equation as basis. [12]

3. Explain briefly
   a) Bacterial Population Dynamics.
   b) The Monod Equation. [12]

4. A completely mixed activated sludge process is to be used to treat waster water flow of 500 m3/ hr having a soluble BOD_5 of 250 mg/l. The concentration of soluble BOD_5 escaping treatment is 15mg/l. Design criteria are as follows.
   $Y = 0.5$, $k = 5\ day^{-1}$, $k_d = 0.06\ day^{-1}$, $K_s = 100 mg/l$,
   And the concentration of MLVSS (X) = 2000 mg/l.
   Compute the following:
   The treatment efficiency
   The mean cell residence time, θc
   The hydraulic retention time, θ
   The volume of the aeration tank. [12]

5. Derive an equation for volume of a Sanitary Landfill. [12]

6. What are the important steps required to under take by the industries for effective waste management, explain in detail. [12]

7. Explain the Pollution Control aspects in fertilizer industry. [12]

8. Explain briefly
   a) Cyclone Separators.
   b) Electrostatic Scrubbers. [12]

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