Code No: C5107 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY 2012
ADVANCED ENVIRONMENTAL ENGINEERING
(CHEMICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks

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1.a) What is Environment and describe details of the Atmospheric Structure?
b) What do you understand by the term inversion? Explain the cause and effects of inversion.

2.a) Define and explain the term sampling? Explain the sampling methods of air pollutants.
b) Calculate the suspended particulate matter concentration in the ambient air from the following high volume air sampler data: Average pressure of the day at station level = 725 mm of Hg, Average temperature = 25^0C, Actual sampling time = 10 hrs, Sampling rate at the beginning = $3m^3$/min, Sampling rate at the end = $2.5m^3$/min, Weight of filter paper before exposure = 3.417 g, Weight of filter paper after exposure = 3.925 g,

3.a) Explain the process of sludge digestion.
b) Design an oxidation pond for the treatment of sewage for an industrial town of population 3000 and the sewage flow is 125 l/c/day. Standard 5 day BOD of the sewage is 350 mg/l. Depth of tank may be taken as 1.0 m assume BOD loading as 250 kg/day/Hectare.

4.a) What do you understand by the efficiency of a trickling filter? How do you determine the efficiency, using NRC formulae?
b) State advantages and disadvantages of a conventional trickling filter.

5.a) Describe the source correction method of air pollutants.
b) Explain the control measures for SO_2, NO_X and CO

6.a) Give various flow diagrams used for single stage and two stage trickling filters. How do you determine the efficiency of these, using NRC formula?
b) Explain with the help of a flow diagram the essentials of a activated sludge process of wastewater with the river water.
(i) Combined discharge (ii) BOD (iii) DO, and (iv) Temperature.

7.a) Differentiate clearly between attached growth processes and suspended growth processes. List various treatment techniques falling under each such process.
b) Why dewatering of sludge is necessary? Explain the method of dewatering the sludge on sludge on sludge drying beds.

8.a) What do you understand by Solid waste management? Explain the sources of solid waste.
b) Enumerate the different methods of solid waste disposal and explain any one in detail.

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