Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 711801N Subject Name: Air Pollution Control and Management

Date: 31 /01 /2011 Time: 02.30 pm – 05.00 pm

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4.

Q.1 **(a)** Describe in detail the classification of Air Pollutants. **07**

(b) Explain all forms of stack plume behaviour by drawing neat sketches. Also state the air pollution potential of each form. **07**

Q.2 **(a)** Describe the instrument used for the measurement of wind speed. What do you understand by Wind Rose? Explain the importance of Wind Rose in air pollution studies. **07**

(b) Define stack height and effective stack height. Explain the concept of plume dispersion and Gaussian concentration equation. **07**

OR

(b) What do you understand by Ambient Air Sampling? Write the objectives of Ambient Air Sampling. Describe any one common method for sampling of suspended particulate matter. **07**

Q.3 **(a)** Enlist the different gaseous sampling collection methods from atmosphere and describe any two in detail. **07**

(b) Describe the importance of Stack Sampling techniques. Explain Isokinetic sampling with neat sketch. **07**

OR

Q.3 **(a)** Describe gravity settling chamber by drawing neat sketch. Also derive the equation for the calculation of minimum size of particle that can be removed in settling chamber. **07**

(b) Explain the principle of cyclone collector with neat sketch. Also describe operating problems and advantages, disadvantages and applications of cyclone collector. **07**

Q.4 **(a)** Enlist different types of wet collectors for removal of particulate matter and describe any two types in detail with neat sketch. **07**

(b) A fabric filter is to be constructed using bags that are 40 cm in diameter and 6 meter long. The bag house is to receive 12 m^3/sec of air and the approximate filtering velocity has been determined to be 1.8 m /min. Determine the number of bags required for continuously cleaned operation. **07**

OR

Q.4 **(a)** Describe various methods to control gaseous contaminants. **07**

(b) An Electrostatic precipitator is to be constructed to remove fly ash particles from stack gases flowing at 12 m^3/sec. Analysis of a similar system shows that the drift velocity can be taken as 2.8 X 10^5dp m/sec. Determine the plate area required to collect 0.5 μm size particle with **07**

(i) 90 % efficiency, (ii) 99 % efficiency and (iii) 99.9 % efficiency.

Q.5 **(a)** Describe dry and wet lime stone process for removal of sulphur dioxide from flue gases with its advantages and disadvantages. **07**

(b) Discuss in detail the control methods for Oxide of Nitrogen (NO_X) and Carbon dioxide (CO_2) emissions. **07**

OR

Q.5 **(a)** Define Air quality and emission standards. Give the Indian Air quality standards for residential, industrial and sensitive areas. **07**

(b) Define and describe Air Pollution indices in detail. **07**

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