Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER– 5th • EXAMINATION – WINTER 2013

Subject Code: 153504 **Date: 04/12/2013**

Subject Name: Air Pollution Control

Time:10:30 to 1:00 **Total Marks: 70**

Instructions:

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

Q.1 **(a)** Define following(60 words): **07**
Air pollution, Box model, Acid rain, Wet lapse rate, Plume rise, Atmospheric stability, Ventilation coefficient.

(b) Explain the process of dust separation in an electrostatic precipitator with the help of suitable diagram. Describe the mechanism of particle charging. **07**

Q.2 **(a)** What is difference between sound and noise? What are the major sources of noise? Give a description of various equipments available for noise measurement. **07**

(b) Write a note on various air pollutants emerging from following industries: **07**
Coal based power plant
Fertilizer industry

OR

(b) Write a note on various air pollutants emerging from following industries: **07**
Pesticides industry
Pharmaceutical industry

Q.3 **(a)** Explain the process of gas/air cleaning by fabric filter. **07**

(b) Describe cleaning of a fabric filter by Shaking, Reverse Air and Pulse Jet mechanism. A fabric filter is to be constructed using bags that are 0.3m in diameter and 6.0 m long. The baghouse is to receive 10 m^3/s of air, and the appropriate filtering velocity has been determine to be 2m/min. Determine the number of bags required for a continuously cleaned operation. **07**

OR

Q.3 **(a)** Explain the process of gas/air cleaning by Cyclone separator. **07**

(b) An air stream with a flow rate of $7m^3/s$ is passed through a cyclone of standard proportions. The diameter of the cyclone is 2 m, and the air temperature is 77°C. Number of effective turns is 5. Viscosity of air is $2.1*10^{-5}$ Kg/m.s. Determine the removal efficiency for a particle with a density of 1.5 g/cm^3 and a diameter of 10µm. **07**
(Standard efficiency curve for a cyclone separator is given at end of question paper)

Q.4 **(a)** Explain behaviour of plume coming out of a chimney in different atmospheric conditions. **07**

(b) What are the functions of CPCB and SPCB under "The air (prevention and control of pollution) act, 1981"? **07**

OR

Q.4 **(a)** Explain the concept and chemistry of photochemical smog? How it can be avoided? **07**

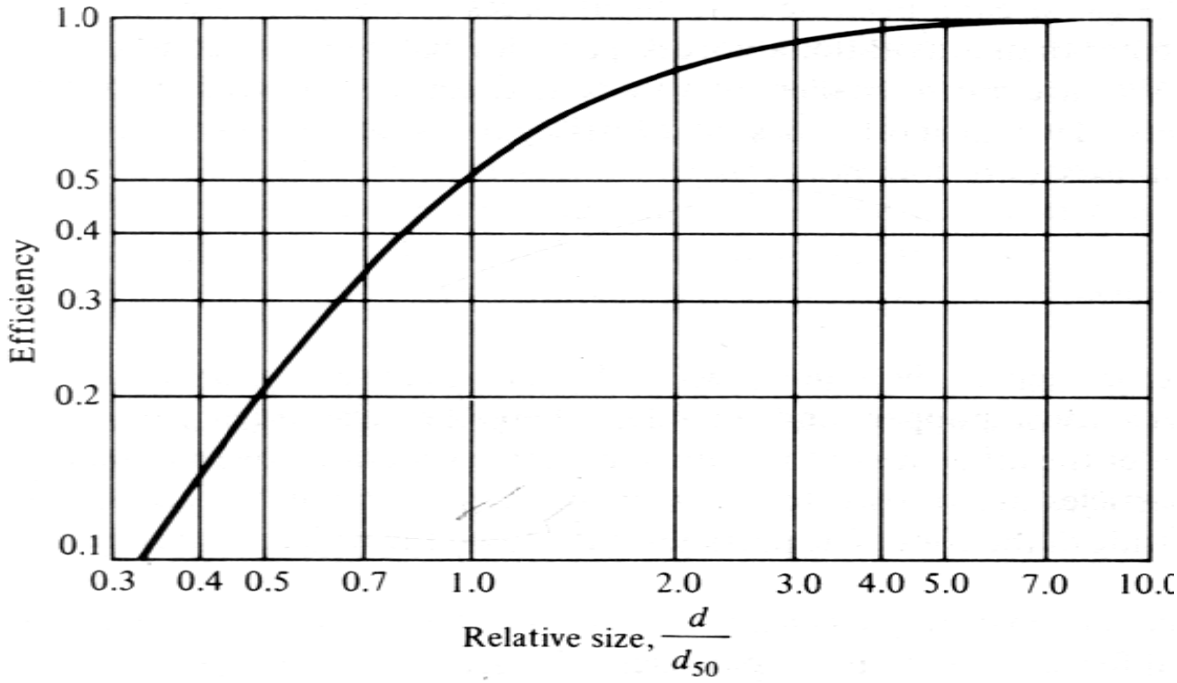
(b) Under "The air (prevention and control of pollution) act, 1981", what obligations have been given to industries and what are the penalties and punishments in case of contravention or non-compliance of any provision of this act? **07**

Q.5	**(a)**	What are the impacts of noise on human health? Which kind of control measures can be used for noise control?	**07**
	(b)	Write a note on following: Bhopal Gas Tragedy MMD and subsidence inversion	**07**

OR

Q.5	**(a)**	Does topography affect the pollutant dispersion? If yes, give two examples in support of your answer.	**07**
	(b)	What do you understand by dispersion modeling? Describe Gaussian model with modification in original equation.	**07**

Standard efficiency curve for a cyclone separator



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