

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 m³/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 7m³/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/cm³ 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: **07**
 Bhopal Gas Tragedy
 MMD and subsidence inversion

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


