Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – WINTER • 2014

Subject Code: 153504 **Date: 03-12-2014**

Subject Name: Air Pollution Control

Time: 10.30 am - 01.00 pm **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)** What is the working principle of Electrostatic precipitator (ESP)? What are the types of ESPs used in industries? **07**

(b) What is the working principle of Fabric filter? Explain with the help of suitable diagram. **07**

Q.2 **(a)** What do you mean by noise? How it can be measured? What are the impacts of noise? **07**

(b) Following atmospheric altitude versus temperature data has been collected at a place: **07**

Altitude (m)	0	100	200	300	400	500	600
Temperature (°C)	21	19	17	15	16	17	18

What would be the MMD?

OR

(b) If following atmospheric condition exists in atmosphere, How high would you expect a plume to rise if it emitted at 24°C from a 100 m stack at DALR. **07**

Altitude (m)	0	100	200	300	400	500	600
Temperature (°C)	23	21	19	17	18	19	20

Q.3 **(a)** Write a short note on following: **07**

- Wind velocity and thermal turbulence.
- Mountain-valley effect on pollutant dispersion.

(b) What do you understand by dispersion modeling? Give a brief classification of various kinds of models. **07**

OR

Q.3 **(a)** Write a short note on following: **07**

- Wind velocity and mechanical turbulence
- Land & sea breeze effect on pollutant dispersion.

(b) Explain the Gaussian model with its assumptions and limitations in detail. What are the modifications done in the original equation? **07**

Q.4 **(a)** Discuss "The Air (Prevention and Control of Pollution) Act, 1981" in brief. **07**

(b) What do you mean by inversion? What are the major types of inversion? Explain Subsidence inversion with suitable diagram. **07**

OR

Q.4 **(a)** Discuss Constitution of control boards and powers conferred to control boards under "The Air (Prevention and Control of Pollution) Act, 1981". **07**

(b) Explain radiation inversion and advective inversion with suitable diagram. **07**

Q.5 **(a)** What do you mean by ventilation coefficient? How is it related with MMD? What do you understand by stack effective height? How does it relate with plume rise. **07**

(b) What do understand by lapse rate? Derive an expression for dry adiabatic lapse rate. **07**

OR

Q.5	**(a)**	What do you mean by air pollution? Write about sources and health impacts associated with oxides of sulphur and nitrogen.	**07**
	(b)	What are the major air pollutants emerging from coal based power plant and from fertilizer industry?	**07**

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