GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – WINTER 2023

Subject Code:3163511   **Date:05-12-2023**
Subject Name: Air Pollution Contol - II
Time:02:30 PM TO 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. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	What are the sources of SO2?	**03**
	(b)	Write a note on Alkalized Alumina process.	**04**
	(c)	Discuss control of oxides of nitrogen by modification of operating conditions and modification of design condition.	**07**
Q.2	**(a)**	Discuss the assumption and limitation of Gaussian Plume modelling.	**03**
	(b)	Discuss the Features of AERMOD.	**04**
	(c)	Discuss control of oxides of Sulphur during combustion.	**07**
		OR	
	(c)	Discuss control of oxides of Sulphur by desulphurization of flue gas by wet methods.	**07**
Q.3	**(a)**	Write the formula for Gaussian Model.	**03**
	(b)	Explain Chemico process in detail.	**04**
	(c)	Discuss the Control of Sulphur dioxide emission by wet scrubbing methods.	**07**
		OR	
Q.3	**(a)**	Explain in detail about Girbotol process and Claus process for sulphur removal during combustion.	**03**
	(b)	Discuss control of oxides of Sulphur by extraction from fuels.	**04**
	(c)	A horizontal parallel-plate ESP consists of a single-duct 38ft high and 20ft deep with a 11-inch plate-to-plate spacing. A collection efficiency of 92.7% is obtained with a flow rate of 2800 acfm. The inlet loading is 6.29 gr/ft^3. Calculate the following: (a)What value of ϕ will yield an efficiency of 99.8%? (b) What will be the drift velocity for the system? (c) What will be the outlet loading? (d) What will the efficiency be if the collection area doubles, while the drift velocity and the volume rate of flow remain the same for ϕ_{old}? (e) What will the efficiency be if the drift velocity doubles, while the collection area and the volume rate of flow remain the same ϕ_{new}? (f) What will the efficiency be if the volume rate of flow doubles, while the drift velocity and the collection area remain the same ϕ_{new}?	**07**
Q.4	**(a)**	What are the limitations of deterministic models?	**03**
	(b)	Write a note on hydrodesulphurization of coal.	**04**
	(c)	A cyclone currently operates with an efficiency of 74%. Assuming that the flow rate is increased by 43%, estimate a revised efficiency.	**07**
		OR	
Q.4	**(a)**	Discuss the various mechanisms to control particulate matter.	**03**

	(b)	Explain GLC determination in detail.	**04**
	(c)	Discuss control of oxides of Sulphur by desulphurization of flue gas by dry methods.	**07**
Q.5	**(a)**	What are the limitations of statistical models?	**03**
	(b)	Discuss the Features of CALINE.	**04**
	(c)	Discuss the control of oxides of nitrogen from effluent gas by catalytic decomposition and reduction.	**07**

OR

Q.5	**(a)**	What the sources of NOx?	**03**
	(b)	Design a gravity settler to remove all iron particulates of 40 μm from a dust laden gas stream having flow as 120 ft^3/s and velocity as 11 ft/s. Consider density of particles as 7.62 g/cm^3	**04**
	(c)	Discuss the control of oxides of nitrogen from effluent gas by adsorption and absorption.	**07**

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