GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER– I (New course)• REMEDIAL EXAMINATION – SUMMER 2015

Subject Code: 2711801   **Date:12/05/2015**
Subject Name: APPLICATION BASED SYSTEMS FOR AIR POLLUTION
CONTROL MANAGEMENT

Time: 10:30 am to 1:00 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)**	Enlist the meteorology parameters and explain any one in detail.	**07**
	(b)	Differentiate between dry adiabatic lapse rate and wet adiabatic lapse rate. Derive dt/dz = -1 ^{o}C/ 100 meter.	**07**
Q.2	**(a)**	Define air pollution index. Explain its significance.	**07**
	(b)	Find out at least five activities in your locality that contribute to air pollution and identify at least one air pollutant from these activities and its likely ill effects.	**07**
		OR	
	(b)	State the factors on which the efficiency of an electrostatic precipitator depends.	**07**
Q.3	**(a)**	Explain wind rose diagram. How to construct wind rose diagram?	**07**
	(b)	Explain stack monitoring kit.	**07**
		OR	
Q.3	**(a)**	Write note on different adsorbent materials in adsorbers.	**07**
	(b)	Explain factors affecting adsorption performance.	**07**
Q.4	**(a)**	Explain combustion control method for NOx control.	**07**
	(b)	Explain lime scrubbing system for SO_2 removal.	**07**
		OR	
Q.4	**(a)**	Write a short note on turbojet engine with neat sketch.	**07**
Q.4	**(b)**	Explain Bag filter with design criteria and neat sketch.	**07**
Q.5	**(a)**	Explain in details the factor affecting the selection of particulate control equipment.	**07**
	(b)	Explain control methods for Volatile Organic Compounds.	**07**
		OR	
Q.5	**(a)**	Design a cyclone separator of maximum particles collection efficiency for 10000 cu.m/hour gas stream at 100 ^{o}C. Consider the gas to be air, releasing 400 g/s of dust. The dust mean diameter 25 µm and Pp (density of particles) is 1400 kg/m3. Estimate the pressure drop and collection efficiency for particle size 20.0 µm.	**07**

(b) Data from the brookhaven national laboratory for neutral   **07**
conditions in the atmosphere indicate that $_y = 0.32 (x)^{0.78}$
and $_z = 0.22 (x)^{0.78}$. for these data, determine Xmax and
Cmax for the data of
Q= 0.90 kg/s, H = 220 m, u= 4.8 m/sec, Stability class C =
X (km) = (a) 1.2 (b) 1.6 (c) 2.0 (d) 2.05 (e) 3.0 (f) 5.0 (g)
10.0 (h) 20.0

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