COURSE CODE: 14M31CE211   MAX. MARKS: 25
COURSE NAME: Air and Noise Pollution Control
COURSE CREDIT: 3   MAX. TIME: 1.5 HRS

Note: Attempt all Questions. Carrying of mobile phones during exams will be treated as case of unfair means. Assume suitable data if required.

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1. A baghouse filter is to treat $75 m^3/s$ of an emission with a concentration of $0.05 kg/m^3$. The K_0 and K_d values are 40,000 $N.s/m^2$ and 40,000 s^{-1} respectively. The maximum allowable pressure drop is 6000 N/m^2 and operational time of filter is 10 hours. Using the above information determine the area of the baghouse filter **(3)**

2. Determine the dimensions of a fly-ash precipitator for an efficiency of 95% to be installed for coal fired boilers for removal having 2.5% sulfur content. The gas flow rate is 600,000 cfm, with a temperature of $300^0 F$. Assume suitable data as necessary **(3)**

3. Derive an expression for visibility, clearly mentioning the assumptions used **(2)**

4. For a certain condition, the limit of visibility is defined when I/I_0 is 0.03. Determine the percentage extinction that occurs in the first (a) 15%; (b) 30% and (c) 50% of path light **(3)**

5. Derive the condition for Potential temperature and with a neat sketch explain its significance **(3)**

6. Discuss the major objectives for conducting a monitoring program for air pollutants. In this context, also discuss the design considerations for setting up the program. **(3+3)**

7. Determine the efficiency of a single cyclone separator (dry type) for treatment of gaseous emissions from furnace having a diameter of 2.5m, a gas velocity of $3x10^{-5} kg/m^3.s$ and a particle velocity of $3500 kg/m^3$. The gas flow rate is 7.5 m^3/s. The size distribution information is as follows **(5)**

Particle size (μ)	0-5	5-10	10-20	20-44	44-64	64-94	> 94
Percent(by weight) for size	64.7	6.79	11.9	8.96	4.25	2.4	1.0