**CE 213-A**

**ASSIGNMENT- 4 (Air Pollution)**

**Emissions from a**n existing power plant have been found to produce an SO2 concentration of 20x10-6 g/m3 at a di**Emissions from a**n existing power plant have been found to produce an SO2 concentration of 20x10-6 g/m3 at a distance of 800 m directly downwind from the stack when the wind speed is 4 m / s from the north during a class C stability situation. At a later date another plant is built 200 m to the west of the original plant. It burns 1818 kg/hr of fuel oil which contains 0.5% sulfur. The second plant has an effective stack height of 60 m, and it has no SO2 emission control. For the same atmospheric conditions listed above, solve Q 1 and Q2 given below.

**Q-1:** Total amount of SO2 released from second plant ond plant has an effective stack height of 60 m, and it has no SO2 emission control. For the same atmospheric conditions listed above, solve Q 1 and Q2 given below.

**Q-1:** Total amount of SO2 released from second plant

**Q-2:** Estimate the percentage increase in SO2 concentration at the downwind site due to the second plant. (Given value of stability class C σy= 86.1 m σz= 52.6 m)

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**Q-3: Mass Balance** - Simple **Box Model**.

A city with dimension W x L x H (7 km x 13 km x 1.5 km) had a wind velocity of 4 m/s. The upwind concentration of SO2 is 10 µg/m3 . The emission rate for the city is 4.5 x 10-6 g/s.m2 . What is the concentration of SO2 over the city?

**Q-4:** Estimate the plume rise for a 2 m diameter stack whose the exit gas has a velocity of 34 m/s when the wind velocity is 4 m/s, the pressure is 1 atm and the stack and surrounding temperatures are 850c and 330 c respectively. (Consider neutral condition)

**Q-5**: z.