3. Write technical notes on (any four) the following:

a) Carbon credit-concept and applications

b) Vehicle emission standards

c) Global circulation of pollutants

d) Determination of SPM and RSPM in ambient air

e) Green house effect-its causes and remedies

f) Site selection and zoning

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Roll No .....

MTEE-205

M.E/M.Tech., II Semester

Examination, December 2015

Air Pollution and Control

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions. State and assume any data if required. Answer should be precise and with case examples wherever necessary.

1. a) Classify sources of air pollution. What are the economic effects of air pollution? Discuss the factors influencing atmospheric deterioration.

b) Describe in brief effect of air pollution on "Taj Mahal".

c) Consider oil droplets of 0.6 μm diameter suspended in air and exposed to daytime radiation. The density of the particles is taken to be 0.90g/cm^3.

i) What is the concentration of particles in micrograms per cubic meter for a visibility of 1 mi, if the value of K, the scattering ratio, is 4.1?

ii) What is the concentration of suspended particles with a density of 2.5g/cm^3 and an effective diameter of 1.0 μm, if the K-value is 2.0 and the visibility is reduced to 5.0 mi?

2. a) Describe the temperature profiles and the dispersion profiles for plumes known as

   i) Looping ii) Coning

   iii) Fanning iv) Fumigation

   v) Lofting vi) Trapping

   b) Sulfur dioxide is emitted at a rate of 160g/s from a stack with an effective height of 60m. The wind speed at stack height is 6 m/s and the atmospheric stability class D values are 36m and 18.5m respectively. Determine the ground level concentration along the center line and crosswind at 50m from the center line for the downwind distance of 500m from the stack in micrograms per cubic meter.

   c) The wind and stack gas speeds are 3 and 6m/s, respectively, and the stack diameter is 2m. The atmospheric stability condition is neutral with a temperature of 300°k, and the stack gas temperature is 440°k. Estimate the plume rise in meters by any two equations.

3. a) Describe the theory of formation of PAN and PBN in details.

   b) Discuss the general diseases and toxicity of pollutants.

4. a) Tabulate the summary of particulate control devices along with their advantages and disadvantages.

   b) A fabric filter is to be constructed using bags that a 0.3m in diameter and 6.0m long. The baghouse is receive $10m^3/s$ of air, and the appropriate filterir velocity has been determined to be 2.0m/min. Determi the number of bags required for a continuously cleane operation.

   c) Describe the latest 'National Ambient Air Qualit Standards'.

5. a) Explain the concept of Industrial Hygiene and enlist th factories involved in environmental hazards.

   b) Discuss the status of air pollution control in variou countries.

6. a) Explain the Gaussian Dispersion model in detail.

   b) Prove that the potential temperature gradient is th difference between the environmental and dry adiabati temperature gradients.

7. a) Describe the control strategies that can be adopted fc reducing auto-exhaust pollution.

   b) Write a detailed technical note on any two of the followin episodes using case examples:

      i) Chernobyl plant disaster

      ii) London smog episode

      iii) Bhopal gas Leakage Tragedy impact as on today