DOON UNIVERSITY, DEHRADUN
Final Semester Examination, 2015
School of Environment & Natural Resources
M.Sc. (Environmental Studies), 1ˢᵗ Semester
Course: EES – 517: Environmental Chemistry

Time Allowed: 3 Hours   *Maximum Marks: 30*
Attempt All Questions from Sections A,B,C.

Note: WRITE CLEARLY YOUR QUESTION NUMBER WHILE ANSWERING TO IT.

SECTION: A (Short Answer Type Questions/ to be answered in about max 50 words).
Attempt any TEN questions.

(Marks: 1 x 10=10)

1. How would you prepare 80 mL of an aqueous solution containing 0.030 g $AgNO_3$ per ml?
2. Write Integrated Rate expression for a second order reaction.
3. What is Bronsted and Lowry theory, for acid- base?
4. Where are the ions dominate in our atmosphere?
5. What is the 'three body reaction'?
6. Write two major ecological effects of the acid rain.
7. Draw distribution of water on the earth.
8. Write a definition of the soil.
9. What is the soil profile?
10. What are the factors influencing the soil formation?
11. Write the ideal composition of the soil in percentage.

SECTION: B (Medium Answer Type Questions to be answered in about 100 words).
Attempt any FIVE questions.

(Marks: 2 x 5=10)

1. Write a detailed note on the buffer solutions, and explain the example of H2PO4-/HPO42- system.
2. The solubility product of $Mg(OH)_2$ at 25 °C is 2.8×10^{-11}. Calculate the solubility of magnesium hydroxide in g/L.
3. Write about Chemical Speciation of Copper, Lead, and Mercury.
4. Explain the formation of PAN in the atmosphere, by a chemical flow diagram.
5. Explain unique properties of water in the context of its role in the environmental process.
6. Compare the solubility of solid, liquid and gases in water.

SECTION: C (Large Answer Type Questions to be answered in about 150 words).
Attempt any two questions.

(Marks: 5 x 2 =10)

1. 50 ml of 0.1 $AgNO_3$ solution is mixed with 25 ml of 0.0005M aq solution of NaCl solution.
   Determine if the precipitate of AgCl will be formed. Given Ksp (AgCl) = 1.7×10^{-10} M^2.
2. Write a detailed note on the chemistry of particulate matter (PM).
3. Explain the physicochemical and ion-exchange properties of soil.