



5/12/16

DOON UNIVERSITY, DEHRADUN  
Final Semester Examination, 2016  
School of Environment & Natural Resources  
M.Sc. (Environmental Studies), 1<sup>st</sup> 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 150 mL of an aqueous solution containing 0.25 g AgNO<sub>3</sub> per ml?
2. For which type of reactions order and molecularity have the same value?
3. What are strong and weak acids? Give one example of each?
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. What is a buffer solution? Give an example of each buffer solution with a pH less than 7 and greater than 7.
2. The solubility product of Mg(OH)<sub>2</sub> at 25 °C is 2.8 X 10<sup>-11</sup>. 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. At 25° C, the K<sub>sp</sub> of Zn(OH)<sub>2</sub> is 1.2 x 10<sup>-17</sup>. At what pH is a solution containing 15 mg/L of zinc as Zn<sup>2+</sup>(aq) saturated with respect to zinc (II) hydroxide?
2. Write a detailed note on the chemistry of particulate matter (PM).
3. Write a note on The Fate of Pollutants of Earth's Surface: Land and Water.