RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
Third Year - Semester I Examination – June / July 2018

CHE 3208 – ENVIRONMENTAL CHEMISTRY

Time: Two (02) hours

Answer **all** questions.
Use of a non-programmable calculator is permitted.

---

1. a) Draw the approximate temperature profile of the atmosphere. Identify the regions and boundaries in it. **(20 marks)**

   b) Why is the temperature of the stratosphere higher than the troposphere? **(20 marks)**

   c) Hydroxyl radical (ȮH) is an important trace component in the atmosphere.

      i. State two (02) sources of ȮH in the atmosphere. **(15 marks)**

      ii. Write down the reactions of ȮH with CH_4 and with CO. **(15 marks)**

   d) Compare London-type smog vs Los Angeles-type smog in terms of their sources, physical and chemical characteristics. **(30 marks)**

2. a) Define the ion exchange capacity of soil. **(20 marks)**

   b) Ion exchange capacity of soil has important environmental and plant nutrient role. Defend this statement using NO_3^-. **(30 marks)**

   b) Briefly explain the "soil organic matter". **(20 marks)**

   c) Discuss the soil forming factors that determine the quantity of organic matter in soil. **(30 marks)**

3. a) List five water quality parameters which you need to determine in order to assess the quality of irrigation water. **(20 marks)**

b) Explain how you would carry out the analysis of irrigation water to determine the parameters listed in (a). **(40 marks)**

c) Explain the effect of acid rain on the quality of ground water. (Balance chemical reactions are expected).

i. If the area contains limestone ($CaCO_3$).
ii. If the area contains albite rocks ($NaAlSi_3O_8$). **(40 marks)**

4. a) State five (05) sources of water pollution. **(25 marks)**

b) What are the primary minerals and secondary minerals? Give two (02) examples for each. **(25 marks)**

c) What are the major anthropogenic sources of SO_2 in the atmosphere? **(20 marks)**

d) The alkalinity of the river water was determined to be 5×10^{-3} mol L^{-1} and its' pH is 8.00. Calculate the concentration of CO_3^{2-} and HCO_3^- in the river. **(30 marks)**

– END –