RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences

Third Year - Semester I Examination – November/December 2016

CHE 3208 - Environmental Chemistry

All symbols carry standard meanings.
Standard symbols may be used without a definition
Graph sheets will be provided
Time allowed two hours
All questions carry equal marks

Answer all questions **Time: TWO (02) hours**

1.

(a) Describe the characteristics of point and non-point sources of pollution. Provide specific examples of each.

(b) What are the major fluxes and reservoirs of phosphorus in the global environment?

(c) What is meant by eutrophication? Describe the environmental impacts of this process.

(d) Discuss the health consequences due to excess nitrate in water resources.

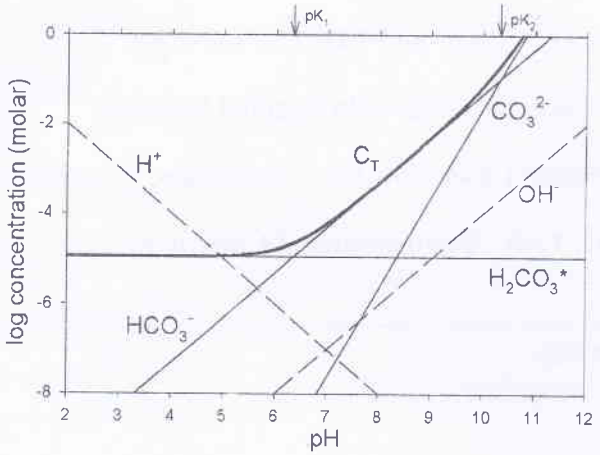
2.

(a) What is a sulfhydryl group, and how does it interact biochemically with heavy metals? How does the interaction affect the processes in the body?

(b) Discuss mercury conversion pathways in the environment identifying most of its toxic forms.

(c) How acid rains are formed? Describe environmental problems occur due to acid precipitation.

(d) What is chemical speciation? A CO_2 water speciation diagram is shown below. Indicate initial conditions used in the construction of this diagram. Calculate the pH of rainwater droplet that passes through the atmosphere. State all assumption made.



3.

(a) How stratospheric O_3 is formed? The O_3 is considered as a natural sunscreen. Explain?

(b) Discuss the role of N_2O in the destruction of O_3.

(c) The O_3 is not beneficial when it occurs in troposphere. Giving examples discuss deleterious effect of troposphere O_3.

(d) Discuss the role of CFC in the destruction of stratosphere ozone?

4.

(a) What are primary and secondary air pollutants?

(b) How photochemical smog is formed? How it differs from the London smog?

(c) Explain the environmental chemistry behind vehicle emission tests.

(d) What is the meaning of PAN? Describes it formation in the atmosphere.

5.

(a) What does POP stand for? Name for pesticides on the United Nations POP list.

(b) Discuss the formation of furan and dioxin in the environment from PCB firing.

(c) For HCB (hexachlorobenzene), log K_{ow} = 5.3. What would be the predicted concentration of HCB due to bio-concentration in the fat of fish that swim in waters containing 0.000010 ppm of the chemical?

(d) What does PAH stand for? Draw the structures of two examples.

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