

D 33386

(Pages : 2)

Name.....

Reg. No.....

**FIRST SEMESTER M.Sc. DEGREE EXAMINATION  
FEBRUARY 2013**

(CUCSS)

Environmental Sciences

ES 1C 02 – ENVIRONMENTAL CHEMISTRY-I

(2010 Admissions)

Time : Three Hours

Maximum : 36 Weightage

**Part A***Answer all questions.**Each question carries 1 weightage.*

1. Why do not molecular oxygen and nitrogen, the primary constituents of the troposphere, absorb infrared radiation?
2. Describe what is meant by “the atmospheric window”.
3. What do you mean by “Los Angels Smog”?
4. What are detergents? How do they differ from soaps?
5. Describe the goals of the Kyoto Protocol with respect to green house gases.
6. Explain four characteristics common to most organic compounds.
7. Explain what is meant by a buffer. How is it normally prepared?
8. In which of the following is the slightly soluble AgBr likely to be most soluble?
  - (a) Pure water.
  - (b) 0.05 M AgNO<sub>3</sub>.
  - (c) 1.25 M AgNO<sub>3</sub>.
9. What is the relationship between acid strength and the value of pK<sub>a</sub>?
10. Explain what is meant by eutrophication.
11. How inert complex differ from metal chelate?
12. Define half-life period and average life of a radioactive element.
13. How do nuclear reactions differ from ordinary chemical reactions?
14. Describe briefly the meaning of (a) n/p ratio ; (b) back ground radiation.

(14 × 1 = 14 weightage)

**Turn over**

**Part B**

Answer any **seven** questions.

Each question carries 2 weightage.

15. Explain how ions, radicals and particulates are formed in atmosphere.
16. What is acid rain? How is it caused? What are its effects on environment?
17. How does a free radical differ from an ordinary molecule? Show why hydroxyl radical is considered as a catalyst for ozone destruction.
18. Explain any *one* method used for the estimation DO in water sample.
19. Describe how to do a BOD test on a water sample.
20. Discuss briefly the theory of acid base indicator.
21. Explain the phenomena of high and low quantum yield.
22. Write a brief note on (a) Ionic product ; (b) Solubility product.
23. Give a brief account of the artificial radioactivity.
24. Describe any *two* methods for detection of radiation.

(7 × 2 = 14 weightage)

**Part C**

Answer any **two** questions.

Each question carries 4 weightage.

25. (a) Name several parts of the atmosphere in which temperature change with altitude and briefly describe the type of reactions taking place.  
(b) Discuss the formation and depletion of ozone. Explain its ill-effects.
26. (a) What are VOCs? Describe their role in the production of photochemical smog.  
(b) Explain photosensitization with examples.
27. (a) Explain in brief the Mohr's method to estimate chlorides.  
(b) Discuss the significance of common ion effect in the separation of metal ions.
28. (a) Compare the behavior of  $\alpha$ ,  $\beta$  and  $\gamma$  radiations in an electric field.  
(b) Describe the uses of radioactive isotopes as tracers.

(2 × 4 = 8 weightage)