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Reg. No.....

FIRST SEMESTER M.Sc. DEGREE EXAMINATION, DECEMBER 2014

(CUCSS)

Environmental Science

ES IC 02—ENVIRONMENTAL CHEMISTRY—I

(2010 Admissions)

Time : Three Hours Maximum : 36 Weightag

Part A

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

1. "The south pole is always colder than the north pole" Justify this statement.
2. Describe the difference between an aerosol and a particulate.
3. Define the term "albedo".
4. "Detergents have already replaced 80% of the world demand for soap". Justify.
5. Describe the evidence that implicates CFCs in the destruction of ozone layer.
6. Why are aliphatic carboxylic acids some time called fatty acids ?
7. How contaminants differ from pollutants ?
8. What is alkalinity in water due to ?
9. What is the relationship between acid strength and the value of pKa ?
10. The COD result for a water sample is twice as large as its BOD. Explain.
11. How inert complex differ from metal chelate ?
12. Define half-life period and average life of a radioactive element
13. Differentiate between nuclear fusion and nuclear fission.
14. Why are α-particles that are absorbed internally by the body particularly dangerous ?

(14 × 1 = 14 weightage)

Part B

Answer any **seven** *questions.*
Each question carries 2 *weightage.*

15. What are VOCs ? Explain the role of VOCs in the production of photochemical smog.
16. How does sulphur play a role in the "Acid rain" problem and how does it influence other environmental processes ?

Turn over

17. How does a free radical differ from an ordinary molecule ? Show why hydroxyl radical is conside as a catalyst for ozone destruction.

18. Explain any one method used for the estimation total nitrogen in soil.

19. What is eutrophication ? How is it caused ? Describe its effect on the aquatic life in an estuar

20. What are adsorption indicators ? Explain the mechanism by which they work.

21. Explain the phenomena of high and low quantum yield.

22. State the solubility product principle. What is its significance ?

23. Describe the uses of radioisotopes as tracers.

24. Write a brief note on "Radiation Hazards".

(7 × 2 = 14 weight

Part C

Answer any **two** *questions.*
Each question carries 4 *Weightage.*

25. (a) Give an account of inorganic particulate matter and show differences from organic particu

(b) What are the factors affecting photochemical reactions ?

26. (a) Describe the functional groups and characteristic structural features of (i) alcol (ii) aldehydes ; (iii) carboxylic acids ; (iv) ketones ; (v) amines and (vi) esters.

(b) Explain photosensitization with examples.

27. (a) Describe any *one* method for the determination of nitrate in water ?

(b) Discuss the significance of common ion effect in the separation of metal ions.

28. (a) Briefly explain the working principle of Scintillation counter.

(b) Discuss the practical limitations associated with the use of nuclear fusion as a source of e

(2 × 4 = 8 weigl