

2015

M.Sc. Part-II Examination

ENVIRONMENTAL SCIENCE

PAPER—IXA

Full Marks : 100

Time : 4 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any five questions from the rest.

1. Answer any ten questions of the following : 10×2

- (i) What is Solar flux ?
- (ii) Define environmental Lapse rate.
- (iii) What is Chemical Oxygen Demand (COD) ?
- (iv) Write the chemical formula of DDT.
- (v) Define 'Solubility Product'.
- (vi) What is Common ion effect ?

(Turn Over)

- (vii) What is frozen free radicals?
- (viii) State Beer's law.
- (ix) What are Saturated and Unsaturated hydrocarbons?
- (x) What is bio-diesel?
- (xi) Write down the name of bases present in DNA.
- (xii) What are carcinogens? Give example.
- (xiii) Define colorimetry method.
- (xiv) Give biological applications of spectrophotometry.
- (xv) What is Retention time?
- (xvi) Write down the use of Flame photometry.
2. (a) Discuss the uses of radio-nuclides.
- (b) Discuss the removal of suspended solids and liquids from waste water. 6+10
3. (a) How SO_2 and MIC disturb the living system.
- (b) Describe major causes of ecodegradation of soil. Add a note on ecodegradation measure. Write the biochemical effects of carbon monoxide. 5+(4+3)+4

4. Elaborately discuss about the toxicity of arsenic and mercury in the environment. 8+8
5. Write explanatory notes on— 4×4
- (i) X-ray diffraction (XRD).
- (ii) Inorganic and organic components of soil.
- (iii) Important features of the carbonate system.
- (iv) Toxicity of cadmium ion.
6. (a) What is 'ozone hole'? Discuss its effect on living system.
- (b) What is meant by chromatography? Name different types of chromatographic method of separation. Write the working principle of GLC. (2+4)+(2+2+6)
7. Mention vertical stratification of the atmosphere? State their respective altitudes and temperature ranges. What are the important chemical species in the first two zones. 16
8. (a) What is photochemical smog?
- (b) What are the main components of photochemical smog?
- (c) Discuss the chemical reactions involved during the formation of photochemical smog. 2+4+10

9. (a) Write down the stoichiometric airfuel ratios of common fuels.
- (b) What is meant by chemical equilibrium of a system?
- (c) What are the water resources of the Earth?
- (d) Write a note on biochemical oxygen demand (BOD).

3+5+5+5

10. (a) Write a note on electrophoresis..

(b) Write down the working principle of HPLC.

10+6