

2017

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 solubility product ?
- (ii) What are carcinogens ? Give two example.
- (iii) What are radionuclides ?
- (iv) Write the names of two acid and two basic indicators.
- (v) What is acid rain ?
- (vi) What is radiocarbon dating ?

(Turn Over)

- (vii) What do you mean by aerodynamic particulate matter ?
- (viii) What are heavy metals ?
- (ix) What is volatile organic compound (VOC) ?
- (x) What is London Smoke ?
- (xi) What is Blue baby syndrome ?
- (xii) What is PAH ?
- (xiii) Define Redox potential ?
- (xiv) Write Hardy-Schulze law.
- (xv) Define grasshopper effect.

2. Write explanatory notes on :

4×4

- (a) Black Carbon.
- (b) Gibbs free energy.
- (c) Photochemical Smog.
- (d) Cation exchange capacity of soil.

3. Write down the principle and applications of (any two) :

2×8

- (a) Gas Liquid Chromatography.
- (b) High Performance Liquid Chromatography.
- (c) Gel Electrophoresis.

4. Define soil. What do you mean by soil classification ? Explain the role of soil microbes towards maintaining soil nitrogen level. Write down the process in flowchart form for estimation of cation exchange capacity of soil.

2+2+6+6

5. (a) Explain why sea water contain high COD level.

(b) Establish the relationship between DO and Biochemical Chemical Oxygen Demand (BOD).

(c) Write down the mechanism of coagulation. 6+4+6

6. (a) Write down the mechanism of PAN formation in the atmosphere. 5

(b) What is MIC ? Why MIC is toxic for human being ? 1+4

(c) Explain how inorganic mercury transformed to methyl mercury in Minamata Bay of Japan ? 6

7. Compare between saturated and unsaturated hydrocarbon. Mention important features of carbonate system. Cite example of two toxic chemical found in air. 8+6+2

8. (a) Differentiate between organo-chlorine and organo-phosphorus pesticides. 6

(b) Write down the mechanism for conversion of parathion to paraoxon. 6

(c) Explain how Ozone layer is affected by chlorofluoro carbon ? 4

9. Illustrate the effect of photochemical oxidants on human and plant. Discuss the effect of Ozone hole on human health. 10+6
10. Write the advantages of filtration technique for removal of raw wastes from polluted water. Explain the consequence of incorporation of DDT in food chain. Explain the mechanism of action of insecticides. 5+5+6
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