

**Five-Year Integrated M. Sc. Examination 2022**  
**Earth and Environmental Science**  
**Semester: V**  
**Paper: EES-3-5-2**  
**Subject: Water Pollution**

**Time: 4 Hours**

**Full Marks: 80**

Questions are of value as indicated on the margin  
**Answer question No.1 and any four from the rest.**

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1. Write short notes on *any four* of the following. 4x4
  - a) Winkler method
  - b) Toxic effects of lead (Pb)
  - c) Furan
  - d) Organochlorines
  - e) Herbicides
  - f) Cycling of mercury
2. Discuss:
  - a) What is meant by BOD<sub>5</sub> values? Why is it important in wastewater analysis? (3+2)
  - b) Enumerate the difference between COD and BOD. Explain why wastewater has high COD in comparison to BOD. (3+2)
  - c) Explain the principle of COD analysis. Mention the interferences in the analysis of COD. (3+3)
3.
  - a) What are POPs? Enlist the POPs and toxicity of at least two POPs. (2+3+2.5+2.5)
  - b) Explain the various physio-chemical factors which predict the fate of POPs in the environment (6)
4.
  - a) What are the major sources of arsenic in the environment?
  - b) Discuss the chemistry of arsenic in groundwater and its mitigation methods. (3+8+5)
  - c) Write a brief note on the toxic effects of arsenic.
5.
  - a) What are the sources and causes of marine pollution?
  - b) Discuss the physico-chemical processes which influence the fate of oil spill? (2+8+6)
  - c) Give a note on the toxic effects of oil spill.
6. Give short note on following
  - a) Source of Cd to the aquatic environment
  - b) Mechanism of Cd toxicity with example (4+8+4)
  - c) Sources of Hg to the aquatic environment
7.
  - a) Write various physical, chemical and biological parameter of potable water. (3+3+2)
  - b) Define water acidity, its method of measurement method and its application for public health (2+3+3)