

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**  
**BACHELOR OF ENVIRONMENTAL SCIENCE DEGREE**  
**ESM114 (2)**  
**BES PART I EXAMINATION**  
**Environmental Chemistry**

**2 HOURS (70 MARKS)**

JUN 2024

**INSTRUCTIONS**

Answer **three** questions out of the **five** questions. You must answer question **one** from SECTION A and any **two** from SECTION B

**SECTION A (COMPULSORY)**

1. Explain the relationship between the anthropogenic greenhouse effect and climate change. **(30 Marks)**

**SECTION B**

2. a). Discuss a non-carbon energy source, mentioning some of its advantages and disadvantages. **(10 Marks)**  
b). Identify the radiation absorbed by ozone in the upper atmosphere and describe the effects of life on earth that would result from a decrease in ozone concentration. **(10 Marks)**
3. Mercury and nitrates cause adverse health problems when present in polluted water. Explain the sources of each of these pollutants and the health problems they cause. **(20 Marks)**
4. Describe the environmental conditions and the key ingredients that are required in the formation of photochemical smog. You may include equations and graphical sketches as aids in your discussion. **(20 Marks)**
5. Discuss the following pollutants which have been shown to biomagnify in living systems (including humans), mentioning some of their beneficial uses and adverse health effects:
- (i) DDT **(10 Marks)**  
(ii) Mercury **(10 Marks)**

*End of paper*