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**071**

**Ph.D. EXAMINATION, May 2019**

(First Semester)

Environmental Technology

ESEM902(B)

*Time : 3 Hours]*

*[Maximum Marks : 100*

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Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

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**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

**Unit I**

1. (a) What is equilibrium ? Explain various types of equilibrium in detail. **10**

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**P.T.O.**

- (b) Describe buffer and buffer intensity in detail. **10**

2. Write short notes on the following :

- (a) Stoichiometry
- (b) Acidity and alkalinity
- (c) Oxidation and Reduction Reactions
- (d) PC-pH diagram. **5×4=20**

### Unit II

3. Briefly explain :

- (a) Global warming potential
- (b) Atmospheric brown cloud
- (c) Ozone layer depletion
- (d) Half life and residence time. **5×4=20**

4. (a) Explain green house effect in detail with global warming potential of green house gases. **10**

- (b) Write short notes on the following :
- (i) Chloro-Flouro carbons with their nomenclature.
  - (ii) Photochemical smog. **5×2=10**

### Unit III

5. Write short notes on the following :

- (a) Dissolved Oxygen
- (b) Eutrophication
- (c) Heavy metal pollution
- (d) COD. **5×4=20**

6. (a) Discuss chemical composition of ocean water, underground water and lake water. **10**

- (b) Explain the various physio-chemical parameter of water. **10**

### Unit IV

7. What is X-ray diffraction ? Explain single crystal XRD and Brag's law. **20**

8. Explain the following : **10×2=20**

- (a) Particle size analysis
- (b) Atomic emission spectrophotometer.