Roll No. .....

Total Pages : 3

754102

January 2023

M.Sc. (Environmental Science)-1 Semester

Environmental Chemistry (EVS 102B)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What is importance of Second law of thermodynamic. (1.5)

(b) How Gibb's free energy related to the environmental process? (1.5)

(c) Define Dobson Unit (DU)? Explain its importance in ozone layer. (1.5)

(d) What are chemical formulae of CFC-124? (1-5)

(e) Explain chapman cycle with diagram. (1.5)

(f) What is Green House Gaseous? Name of any *five* GHG. (1.5)

(g) Define Conductivity. How much conductivity of glucose solution? (1.5)

(h) What are the major natural sources of NPK in soil? (1.5)

(i) Write the name of any *three* green solvent. (1.5)

(j) What is importance of microwave heating in green synthesis? (1.5)

PART–B

2. Explain the following :

(a) Impact of Radon Gas.

(b) Thermal Inversion.

(c) Arsenic toxicity. (5×3=15)

3. (a) Calculate the ΔG for the reaction of conversion of ATP into ADP at 25°C. The change in enthalpy is 19.07 kcal and ΔS is 80 cal/K. (5)

(b) What is chemical kinetics and its importance? Discuss factors which affect the rate of reaction. (10)

4. Write a short note on :

(a) Acid Rain.

(b) PAN and MIC.

(c) Photochemical Smog. (5×3=15)

5. (a) What is importance of humus and C:N ratio in soil properties and quality? (5)

(b) What is lead pollution? Discuss in detail about sources, fate, and toxicity in environment. (10)

6. (a) Discuss in detail about the chemistry and mechanism (mechanism-I and II) of Ozone layer depletion. (10)

(b) Explain the importance of industrial ecology in green and sustainable chemistry. (5)

7. (a) Discuss in details about green chemistry principles. (10)

(b) Potassium chlorate decomposes upon slight heating in the presence of a catalyst, according to the reaction below.

$2KClO_3\ (s) \rightarrow 2KCl\ (s) + 3O_2\ (g)$

In a certain experiment, 30.0 g $KClO_3$ is heated until it completely decomposes. What is the theoretical yield of oxygen gas? The experiment is performed, the oxygen gas is collected, and its mass is found to be 12 g. What is the percent yield for the reaction? (5)