SHRI RAMSWAROOP MEMORIAL UNIVERSITY

End Semester Examination (2021-22)-Odd Semester

M. Sc. (Environmental Science) – I Year (I Sem)	
Course Name: Environmental Chemistry	**Code: MCE1006**
Time: 02 Hours	**Max Marks: 60**

University Roll No.															
(To be filled by the Student)															

Note: Please read instructions carefully:

a) *The question paper has 03 sections and it is compulsory to attempt all sections.*

b) *All questions of Section A are compulsory; questions in Section B and C contain choice.*

Section A: Very Short Answer type Questions **Attempt all the questions.**		**BL**	**CLO**	**Marks (10)**
1.	Define green chemistry and its role in protecting the environment.	BL1	CLO1	02
2.	Discuss the term 'buffer capacity'.	BL2	CLO1	02
3.	Define sodic soils and cation exchange capacity.	BL2	CLO2	02
4.	Define the term 'Sedimentation'.	BL2	CLO3	02
5.	Name two properties of water which makes it an excellent solvent.	BL1	CLO2	02
Section B: Short Answer Type Questions **Attempt any 03 out of 05 questions.**		**BL**	**CLO**	**Marks (30)**
1.	Discuss greenhouse effect with a suitable diagram. What are the various greenhouse gases which affect the climate?	BL2	CLO1	10
2.	Calculate the pH of a solution containing 10^{-8} M HCl and 10^{-11} M NaOH.	BL3	CLO1	10
3.	Discuss and differentiate between 'Langmuir' and 'Freundlich' isotherms highlighting their significance.	BL2	CLO2	10
4.	Differentiate between PM10 and PM2.5 particles in air, highlighting the health impacts of these particles on humans.	BL1	CLO3	10
5.	Discuss the causes of acid rain. Mention the potential harm which may be caused by acid rain on flora and fauna.	BL2	CLO4	10
Section C: Long Answer Type Questions/Case Study **Attempt any 01 out of 03 questions.**		**BL**	**CLO**	**Marks (20)**
1.	Calculate the BOD of a sewage sample, is 5 mL of the sample was diluted to 300 mL. The dissolved oxygen concentration was found to be 0.0065 g/L initially and 5.3 ppm at the end of 3 days.	BL3	CLO3	20
2.	Discuss 'zero order', 'first order', and 'second order' reactions. Also tabulate the difference between 'physisorption' and 'chemisorption' processes.	BL3	CLO4	20
3.	Balance the following equations: a. $Ca(H_2PO_4)_2 + NaHCO_3 \rightarrow CaHPO_4 + Na_2HPO_4 + H_2O + CO_2$	BL5	CLO4	20

	b. $Al_2(SO_4)_3.14H_2O + Ca(HCO_3)_2 \rightarrow Al(OH)_3 + CaSO_4 + H_2O + CO_2$ c. $SO_3^{2-} + Fe^{3+} + H_2O \rightarrow SO_4^{2-} + Fe^{2+} + H^+$ d. $I_2 + IO^{3-} + H^+ + Cl^- \rightarrow ICl_2^- + H_2O$ e. Oxidation of NH4+ to NO3-			
