Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Geochemistry **Semester: II**
Program: MSc Petroleum Geosciences **Time : 03 hrs.**
Course Code: PEGS 7030 **Max. Marks: 100**

Instructions: Attempt all questions. There is internal choice in Q9 and Q10.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Name four geochemical super systems of earth.	**4**	**CO1**
Q2	Define gamma ray.	**4**	**CO1**
Q3	Name four most abundant elements on earth in decreasing order of their abundance.	**4**	**CO1**
Q4	Name one geochemical equipment that is used to measure whole rock major element composition of a rock sample.	**4**	**CO1**
Q5	Define liquidus in a magmatic system. Draw suitable figure to illustrate.	**4**	**CO2**
	SECTION B **(4Qx10M= 40 Marks)**		
Q6	Discuss the uses of Geothermometry and Geobarometry towards understanding geological history of a terrain.	**10**	**CO2**
Q8	Discuss various theories of formation of primitive atmosphere and its transformation to present state.	**10**	**CO4**
Q9	Discuss theory of mantle convection and explain how it leads to heat loss from earth. Draw suitable diagram to show mantle convection cycle inside earth. **OR** Define hydrosphere. What are major dissolved constituents present as ionic species in seawater and trace their sources from which they are brought to ocean.	**10**	**CO4**
Q10	What is air pollution? What are main constituents of air pollutants? Discuss how the pollution of atmosphere led to ozone hole.	**10**	**CO3**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 1	Define radiogenic isotopes. Discuss the basic principles of formation of daughter nuclei from a parent radionuclide and derive the equation of radiogenic decay.	**20**	**CO6**

	OR With suitable figure, discuss in detail different components of carbon biogeochemical cycle. Discuss why this cycle is vital to survival of life forms on earth.		
Q11	With suitable diagram, define phase, component and degree of freedom in a thermodynamic system. For one component system, write the equation of degree of freedom and show how it varies at different point on the diagram.	**20**	**CO5**