Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2023

Course: Inorganic materials of industrial importance **Semester : Vth**
Program: B.Sc. Hons. Chemistry

Time : 03 hrs.
Course Code: CHEM-3019 **Max. Marks: 100**

Instructions: ***Read the question carefully***

SECTION A
(5Qx4M=20Marks)

S. No.		**Marks**	**CO**
Q 1	Mention any one important usage of nitroglycerin in medicinal chemistry. How can we prepare nitroglycerin in a chemical laboratory?	**4**	**CO2**
Q 2	How dangerous are very small quantities of TNT (trinitrotoluene)? Write the chemical equations used in the preparation of this compound.	**4**	**CO2**
Q 3	Give two examples of phosphate fertilizers and discuss their importance.	**4**	**CO1**
Q 4	Write a short note on common advantages and disadvantages of inorganic fertilizers.	**4**	**CO1**
Q 5	Mention two examples each for electrodes (anode and cathode) used in lithium-ion batteries.	**4**	**CO2**

SECTION B
(4Qx10M= 40 Marks)

Q 6	How will differentiate between soft and hard glasses. Give explanation with two examples in each case.	**10**	**CO1**
Q 7	Recall the manufacturing processes used in glasses. Explain all the steps involved in such processes. OR Write a short note on the following fertilizers including their advantages and disadvantages: i) Phosphates	**10**	**CO1** **CO2**

	ii) Nitrates		
Q 8	Describe in detail the functioning of sodium-ion battery	**10**	**CO2**
Q 9	Differentiate between homogeneous and heterogeneous catalyst including one example each.	**10**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
Q 10	What are *glasses*? What do you mean by the term 'supercooled liquid' in *glasses.* State the composition and general properties of the following: i) Pyrex glass ii) Alumina-silicate glass iii) Quartz	**20**	**CO3**
Q 11	What is Ziegler-Natta (ZN) catalyst. Draw the chemical structures of two well-known ZN catalysts. Discuss all the steps involved in polymerization of alkenes using such catalysts. OR Explain and draw all the steps involved in the catalytic cycle of alkene hydrogenation driven by Wilkinson's catalyst. How does the steric factor on double bond affect the catalytic process?	**20**	**CO3**