CHE-02

ASSIGNMENT BOOKLET

Bachelor's Degree Programme (B.Sc.)

INORGANIC CHEMISTRY

(Valid from 1st January, 2021 to 31st December, 2021)

It is Compulsory to submit the Assignment before filling in the Term-End Examination Form.

Please Note

- You can take electives (56 to 64 credits) from a minimum of TWO and a maximum of FOUR science disciplines, viz. Physics, Chemistry, Life Sciences and Mathematics.
- You can opt for elective courses worth a MINIMUM OF 8 CREDITS and a MAXIMUM OF 48 CREDITS from any of these four disciplines.
- At least 25% of the total credits that you register for in the elective courses from Life Sciences, Chemistry and Physics disciplines must be from the laboratory courses. For example, if you opt for a total of 64 credits of electives in these 3 disciplines, at least 16 credits should be from lab courses.
- You cannot appear in the Term-End Examination of any course without registering for the course. Otherwise, your result will not be declared and the onus will be on you.

School of Sciences
Indira Gandhi National Open University
New Delhi
(2021)

Dear Student,

We hope, you are familiar with the system of evaluation to be followed for the Bachelor's Degree Programme. At this stage you may probably like to re-read the section on assignments in the Programme Guide that we sent you after your enrolment. A weightage of 30 per cent, as you are aware, has been earmarked for continuous evaluation, which would consist of one tutor-marked assignment. The assignment is based on Blocks 1, 2, 3 and 4.

Instructions for Formatting Your Assignment

Before attempting the assignment, please read the following instructions carefully.

1. On top of the first page of your answer sheet, please write the details exactly in the following format:

ENROLMENT No.: …...……..……

NAME :……..……

ADDRESS :…..…….……

……..……

……..……

COURSE CODE : ….....…..

COURSE TITLE : ….....

STUDY CENTRE : ….....……

DATE:……..…….

(NAME AND CODE)

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

2. Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3. Leave 4 cm margin on the left, top and bottom of your answer sheet.

4. Your answers should be precise.

5. While writing answers, clearly indicate the Question No. and part of the question being answered.

6. Please note that:

   i) The Assignment is valid from 1st January, 2021 to 31st December, 2021.

   ii) The response to this assignment is to be submitted to the Study Centre Coordinator within 12 weeks of the receipt of this booklet in order to get the feedback and comments on the evaluated assignment.

   iii) In any case, you have to submit the assignment response before submission of examination form for appearing in the term end examination.

7. We strongly suggest that you should retain a copy of your assignment responses.

   Wishing you all good luck.

Tutor Marked Assignment
INORGANIC CHEMISTRY
Elective Course in Chemistry

Course Code: CHE-02
Assignment Code: CHE-02/TMA/2021
Maximum Marks: 100

Note: Answer all the questions given below.

1.		Explain the following:	(10)
	a)	Size of atoms in the periodic table does not increase with increasing atomic number.	
	b)	The first ionization energy of copper is higher than that of potassium whereas the second ionization energy is in the opposite order.	
	c)	Beryllium sulphate is soluble is water while barium sulphate is not.	
	d)	Alkaline earth metals are denser and harder than alkali metals.	
	e)	Graphite and diamond differ markedly in their hardness and electrical conductance.	
2.	a)	Write the merits and demerits of hydrogen as a fuel.	(5)
	b)	Giving reasons explain which of Al_2O_3, Tl_2O_3 and Tl_2O is most-basic.	(5)
3.	a)	What is the role of cryolite in the electrochemical reduction of alumina during the preparation of aluminium? Why the graphite anodes in this process have to be replaced from time to time?	(5)
	b)	What is the product formed in the reaction of nitric acid with metals. Compare it with the reaction with other metals.	(5)
4.	a)	Write the equations for the following: i) sulphur is boiled with caustic soda solution. ii) hydrogen sulphide gas is passed in aqueous solution of ferric chloride. iii) sulphur dioxide gas is passed in aqueous solution of hydrogen sulphide gas. iv) hydrogen peroxide is added to an acidified solution of potassium permanganate. v) chlorine water is added to an aqueous solution of sodium thiosulphate	(5)
	b)	Why fluorine is the stronger oxidsing agent among the halogens.	(5)
5.	a)	Give reasons for the late discovery of noble gas compounds. Write the reaction of xenon trioxide with alkali solution.	(5)
	b)	Describe the method of extraction of sulphur from native deposits. Illustrate your answer. Give the industrial uses of sulphur.	(5)
6	a)	Why are the bonds between S and O much shorter than expected for a single bond in its oxides?	(5)
	b)	What is the usual oxidation number of fluorine ? Why fluorine cannot have any excited state or any other oxidation number? What is the oxidation state of chlorine in ClO_2 and Cl_2O_6?	(5)
7.	a)	Write the names of the following oxoacids and deduce the oxidation number of halogen atom in each. i). HOCl ii) HOClO iii) HOBr iv) $HOClO_3$	(5)
	b)	Explain the structure of XeO_3 on the basis of Valence Shell Electron Pair Repulsion (VSEPR) theory.	(5)
8.	a)	Why is the reaction of XeF_4 with water violent? Explain with the help of appropriate equations.	(5)
	b)	When does ionisation of an atom of a transition element take place? Which electrons are removed first and why? Explain with suitable examples.	(5)
9.	a)	Why the separation of actinides is very difficult?	(5)
	b)	Which oxidation state of the lanthanides and actinides is the most stable and why?	(5)
10.	a)	What are ligands? What is a bidentate ligand ? Give one example of a bidentate ligand.	(5)
	b)	What are Ellingham Diagrams?	(5)