Code: A-C223113-A	**I Semester Exam – 2024-25**	3 x 890
Std.: XI	Sub: **CHEMISTRY**	Marks: **50**
Date:	Roll No.: _____	Time: **2½ hrs.**

General Instructions :-

The question paper is divided into 4 section.

1. **Section-A** : Q.No. 1 contains Seven multiple choice type of questions carrying one mark each.
   Q.No.2 contains Seven very short answer type of questions carrying one mark each.
2. **Section-B** : Q.No. 3 to Q.No. 13 contains Eleven short answer - I type of questions carrying two marks each.
3. **Section-C** : Q.No.14 to Q.No.19 are contains Six short answer - II type of questions carrying three marks each.
4. **Section-D** : Q.No.20 to Q.No.23 contains Four long answer type of questions carrying four mark each.
5. Use of logarithmic table is allowed. Use of calculator is not allowed.
6. Figures to the right indicate full marks.
7. For each MCQ, correct answer must be written along with its alphabet.
   e.g (a) ..... / (b) ..... / (c) ..... / (d) .....
   Only first attempt will be considered for evaluation.

Section - A

Q.1 Select and write the correct answer. 7

1) Which molecule is linear?
   a) SO_3 b) CO_2 c) H_2S d) Cl_2O
2) p-orbitals are .... in shape.
   a) spherical b) dumb bell c) double dumbbell d) diagonal
3) If the valence shell electronic configuration is ns^2np^5 the element will belong to .....
   a) alkali metals b) halogens
   c) alkaline earth metals d) actinides
4) How many gm of H_2O are present in 0.25 mol of it?
   a) 4.5 b) 18 c) 0.25 d) 5.4
5) Oxidation number of oxygen in superoxide is .....
   a) –2 b) –1 c) –1/2 d) 2
6) The energy difference between the shells goes on .....when moved away from the nucleus.
   a) Increasing b) decreasing c) equalizing d) static
7) Chemical reaction in which oxidation and reduction processes takes place simultaneously is known as ..... reaction.
   a) Redox b) precipitation c) Complexometric d) titration

Q.2 Answer the following. 7

1) Define: hybridization
2) How many particles are present in 1 mole of a substance ?
3) Which halogen does always show oxidation state -1 ?
4) The lanthanide are placed in the periodic table at the ?
5) Calculate the oxidation number of the underlined atom in $H_2\underline{S}O_4$
6) State Heisenberg uncertainty principle
7) The mass of an atom of hydrogen is 1.008 u. What is the mass of 18 atoms of hydrogen?

P.T.O

Section - B

Attempt Any Eight of The Following : **16**

Q.3 Distinguish between Sigma and Pi bond.

Q.4 Match the pairs :

Column A	Column B
1) Neutron	a) Six electrons
2) p-orbital	b) -1.6×10^{-19} C
3) Charge on electron	c) Ultraviolet region
4) Lyman series	d) Chadwik

Q.5 Give reason HF is a polar molecule.

Q.6 Why the second ionization enthalpy is greater than the first ionization enthalpy ?

Q.7 Write the formulae for the following compounds:
a. Mercury (II) chloride
b. Thallium (I) sulphate
c. Tin(IV) Oxide
d. Chromium (III) Oxide

Q.8 Write the condensed orbital notation of electronic configuration of the following elements:
(a) Oxygen (Z=8) (b) Silicon (Z=14)

Q.9 BF_3 molecule is planar but NH_3 pyramidal. Explain.

Q.10 Write the formula to calculate bond order of molecule. Also find out bond order of oxygen molecule.

Q.11 Convert the following degree Celsius to degree Fahrenheit.
a. 40°C
b. 30° C

Q.12 In case of bond formation in acetylene molecule:
a. How many covalent bonds are formed ?
b. State the number of Sigma and π- bonds formed.

Q.13 What is the volume of Carbon dioxide occupied by
i) 5 moles and ii) 0.5 mole of Carbon dioxide gas measured at STP

Section - C

Attempt any <u>Four.</u> **12**

Q.14 Balance the following redox reaction by half reaction method :
$Bi(OH)_{3(s)} + SnO_{2\ (aq)}^{2-} \rightarrow SnO_{3\ (aq)}^{2-} + Bi_{(s)}$

Q.15 Write the orbital notations for the electrons in orbitals with the following quantum numbers:
(a) n=2, l=1 (b) n=4, l=2 (c) n=3, l=2

Q.16 Identify the type of overlap present in a) H_2 b) F_2 c) H-F molecule.

Q.17 Define ionization enthalpy. Name the factors on which ionisation enthalpy depends? How does it vary down the group and across a period?

Q.18 i) Define the terms : a) isotones b) isoelectronic species
ii) Name the element that shows simplest emission spectrum.

Q.19 Explain : electronegativity and electron gain enthalpy. Which of the two can be measured experimentally?

Section - D

Attempt Any Two of The Following : 8

Q.20 Predict the shape and bond angles in the following molecules:
(a) CF_4 (b) NF_3 (c) HCN (d) H_2S

Q.21 i) State and explain Pauli's exclusion principle.
ii) Explain in brief, the significance of azimuthal quantum number.

Q.22 i) Define:
a. Screening effect
b. Ionic radius
ii) Give reasons Fluorine has less electron affinity than chlorine.

Q.23 i) Calculate the mass of potassium chlorate required to liberate 6.72 dm^3 of oxygen at STP. Molar mass of potassium chlorate is 122.5 g mol^{-1}.

ii) Write the SI units of a) Temperature b) Electric current.