Chemistry Exam
On chapter (1) to chapter (6)

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Question (1):

A) Choose the correct answer:

1- An element its electronic structure is ($_{18}$Ar) $4s^2$, $3d^{10}$, $4p^3$,it belongs to .....
a) Period (5) group (4) b) Period (4) group (5)
c) Period (2) group (4) d) Period (5) group (2)

2- The attraction force between water molecules and sodium and chloride ions is due to water molecules are .....
a) Polar b) Linear c) Symmetric d) Non-polar

3- The chemical formula Alkali metals oxide is .....
a) X_2O b) XO c) X_2O_3 d)X_2O_2

4- The alloy of iron and carbon is called .....
a) Siderite b) cementite c) limonite d) haematite

B) Explain with drawing how can you prepare ammonia gas in lab., write down the symbolic balanced equation , then explain what would happen when:
1- Passing ammonia gas in diluted nitric acid solution.
2- Passing ammonia gas in hydrogen chloride gas.

C) A sample of iron ore contains 30% of iron III oxide Fe_2O_3 , how many tons of ore required to produce one ton of iron metal ? (Fe=56 , O=16)

Question (2):

A) Write the scientific term that represent these statements:
1- The molecule is one unit with multinuclear in which its atomic orbitals are mixed or hybridized forming molecular orbitals.
2- Amount of energy required to remove the most loosely electron from gaseous atom.
3- The number that defines number of orbitals in sublevel, and its shape, direction in space around the nucleus.
4- Chemical substances change their colour according to the medium and they are used in identify the end point during reaction.

B) Mention one use for the following :
1- Sodium carbonate 2- Slag
3- Phosphorous 4- Quantitative analysis

C) Explain with the help of balanced chemical equations how can you differentiate between:
1- Copper chloride solution and aluminum chloride solution.
2- Iron II chloride solution and iron III chloride solution.

Question (3):

A) Give scientific explanation for each statement:

1- The decrease in size in elements of first transition series is small.

2- Spectral line is a characteristic property for the element.

3- Electron affinity of fluorine is less than that in chlorine.

B) During titration experiment, 20ml of calcium hydroxide solution $Ca(OH)_2$ neutralizes 25 ml of hydrochloric acid 0.05 M .calculate the concentration of sodium hydroxide (Ca = 20 , O =16 , H = 1).

C) Compare between:

1- Electro negativity and electron affinity.

2- Covalent bond and coordinate bond.

3- SP^2 hybridization and SP^3 hybridization.

4- Representative elements and noble elements.

5- Principal quantum number and secondary quantum number.

Question (4):

A) Fill in the following table:

Chemical compound	Its formula	Chemical compound	Its formula
Washing soda		Carnallite	
Appitite		dolomite	
Ammonium sulphate		Arsine	

B) How can you obtain : (write down the balanced chemical equation)

1- Sodium carbonate from sodium chloride.

2- Iron II oxide from iron III chloride.

C) Explain the change in oxidation- reduction in the following equation:

$$N_2 + O_2 \xrightarrow{\text{electric arc}} 2NO$$

$$Fe_2O_3 + 3CO \xrightarrow{\text{more } 700^o} 2Fe + 3\,CO_2$$

Question (5):

A) What is meant by:

1- Thomson atom 2- Oxidation number 3- Metallic bond 4- Titration

B) Calculate the density of oxygen O_2 at STP (O = 16)

C) Match between columns (B) , (C) and (A):

(A)	(B)	(C)
1- cobalt	i. Obtained from CaC_2	a) Its formula Sb_2S_3
2- antimony Sulphide	ii. Polar compound	b) Hydrogen bonds between its molecules
3- Calcium Cyanamid	iii. Has 12 isotope	c) Agriculture fertilizer
4- Hydrogen Fluoride	iv. Used in secrete ink	d) Used in coloring glass
	v. Used in dyes	e) Produce coordinate bonds
	vi. Has coordinate bond	f) Used in explosive materials