

# Step Academy official

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STUDENT NAME	
PAPER CODE	12333
TIME ALLOWED	
Paper Date	



CLASS	9th
SUBJECT	CHEMISTRY
TOTAL MARKS	
Paper Type	

## Q1. Write short answers of the following questions.

- 1 . Discuss the History of Chemistry?
- 2 . Write a note on the greek period.
- 3 . What is difference between an atom and ion?
- 4 . What are fundamental particles of an atom?
- 5 . What is Isotope? Explain by examples.
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- 7 .  
Aluminum is represented as **Al 13/27**. Draw the structure of Aluminum. Write its electronic configuration
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Aluminum is represented as **Al 13/27**. Draw the structure of Aluminum. Write its electronic configuration
- 9 . Draw the structure of hydrogen isotopes.
- 10 .  
How many electrons are present in each of following atoms? Assuming that each is a neutral atom identifies the element.  
**a. 1s<sup>2</sup>, 2s<sup>2</sup>, 2p<sup>6</sup>, 3s<sup>1</sup>**      **b. 1s<sup>2</sup>, 2s<sup>2</sup>, 2p<sup>6</sup>, 3s<sup>2</sup>, 3p<sup>5</sup>**,      **c. 1s<sup>2</sup>, 2s<sup>2</sup>, 2p<sup>6</sup>, 3s<sup>2</sup>, 3p<sup>6</sup>, 4s<sup>2</sup>**
- 11 . Why atom is considered as neutral particle? Give reason.
- 12 . The mass of an atom is present in its nucleus. Can you explain it?
- 13 .  
What is the reason that physical properties of the isotopes are different but their chemical properties are the same?
- 14 . Draw the structure of carbon isotopes. Then write down the number of proton, neutron and electron.
- 15 . How many electrons could contained in K, L, M and N energy levels.
- 16 . Write detailed electronic configurations for **Li 3/7**, **C 6/12** and **Mg 12/24**
- 17 . Write the symbol for an isotope:
- 18 .

Which element to group IA is not an Alkali metal and why?

19 . Place the following elements in order of increasing ionization energy: Na, S, Mg and Ar.

20 . Name the group and state the group number of each of the following elements.

- a. K b. Ne c. Be d. Cl e. C

21 .

Which element is the most electronegative among C, N, O, Br and S? Which group does it belongs to?

22 . How do first ionization energies of representative elements vary across a period and down a group?

23 . Which element is found in,

- a. Period 2, Group VIIA b. Period 4, Group IIIA
- c. Period 5, Group VIA d. Period 1, Group VIIIA

24 . How will you differentiate between representative and transition elements?

25 .

Make a general sketch of the periodic table showing s, p, d and f-block elements (without showing the symbols of elements).

26 . Why the s-block elements have two groups only?

27 .

What type of element in Sulphur (S), a representative element, a transition element or lanthanide element?

28 . What is chemical bond?

29 . What is electron sea model of metallic bonding?

30 . Why most atoms are chemically bonded to other atoms in nature?

31 . Identify and define the four major types of chemical bonding.

32 . Arrange the following from strongest to weakest attraction:

- a. Covalent bond
- b. Dipole-Dipole interaction
- c. Hydrogen bond d. Ionic bond

33 . Why ionic compounds are good electrolyte in molten and solution form not in solid form.

34 . What type of element/atoms tends to form the following types of bonding?

- a. Ionic b. Covalent c. Metallic

35 . Give an example of non-polar molecule with polar bonds. Give reasons.

36 . Predict the bond type (ionic, polar covalent, non-polar covalent) in each of the following:

1.  $\text{CaCl}_2$  b.  $\text{H}_2\text{O}$  c.  $\text{CO}_2$  d.  $\text{C}_2\text{H}_4$

37 . Why ionic compounds are good conductors compared to covalent compounds.

38 .

Give the reason that why bond is always polar?

39 . Can you reason why it takes longer time to cook at high altitude?

40 .

Glass softens over a wide range of temperature. Ice melts at a specific temperature. Explain the reason for this difference.

41 .

Explain why it happens that on a hot summer day when there is sweat on the body of a person, one feels cool under fast moving fan?

42 . Why are the densities of gases lower than that of liquids?

43 . What is the relationship between the atmospheric pressure and boiling point of a liquid?

44 . Why a gas is compressible but a solid is not compressible? Give reason.

45 .

Is sea water a solution? How would you prove with a simple experiment whether it is pure water or solution?

46 . A bottle in a drug store contains a label "3 percent Hydrogen peroxide". What does it mean?

47 . Classify the following as a solution, colloids or suspension and explain why:

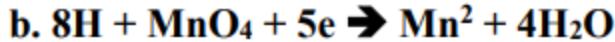
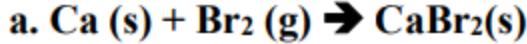
- i. Milk ii. Hot cup of tea iii. Orange juice with pulp iv. Mayonnaise
- v. Listerine mouthwash vi. Milk of Magnesia v. Cheese viii. Mist
- ix. Bottled water

48 . Why we stir paints thoroughly before using it?

49 . Why suspension and solution do not show Tyndall effect, while colloids do?

50 . Write a note on prevention of corrosion and its techniques.

51 . Indicate which element is reduced in the following reactions.



52 . Why NaOH is a strong but NH<sub>4</sub>OH is weak electrolytes?

53 . How to prevent corrosion? Enlist few of methods.

54 . Write chemical reactions that occur in Nelson's cell.

55 . Write an example from daily life which involves the oxidation-reduction reaction.

56 . Assign oxidation numbers to each atom in the following compounds.

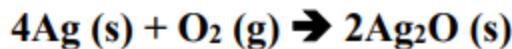


57 . Why oxygen is necessary for rusting?

58 .

Sketch the Daniel cell, labeling the cathode, anode and the direction of flow of electrons.

59 . What is Oxidation number of silvers on each side of the following equation?



60 . Write the characteristic of Metal and Non-Metals.

61 . Write the physical properties of Halogens.

62 . Identify at least two groups which contain only metallic elements.

63 . Write the reaction of group IA metals with oxygen, with balance equations.

64 . State the physical properties of metals.

65 . How does sodium act as reducing agent and write down its reaction also?

66 . Ionization energy of Alkaline earth metals is higher than alkali metals, why?

67 . Pure gold is not used for ornaments, why?

68 . Write down the reaction of chlorine with sodium hydroxide with balance equation.

69 . How does ionization energies values vary in a group?

70 . What happens during displacement reaction in halogens?

**Q2. Write detailed answers of the following questions.**

1 . Write a note on Muslim Period?

2 . Discuss the contributions of some prominent Al-Chemists in the development of Chemistry?

3 . Define chemistry, state and explain the main branches of chemistry.

4 . Define the following with examples.

Element Compound Mixture

5 . Write note on the following.  
Relative atomic mass      Atomic mass unit

Average atomic

6 . Define molecules and there types:

7 . Define gram atomic mass, gram molecular mass and gram formula mass of the element.

8 . State and explain with examples.  
The empirical formula of compound

The molecular formula of compound

9 . What do you understand by the terms mole and Avogadro's number. Give example.

10 . Compare and contrast a mixture and compound. Give example of each of them.

How will you  
classify molecules?

Support your answer  
with at least two  
example of each.

11 . What is molecular mass of a compound? How will you differentiate it from formula?

12 . What is Isotope? Explain by examples.

13 . What do you mean by the term electronic configuration?

14 . Explain the uses of Isotopes?

15 . There are three isotopes of uranium having atomic number 92 and mass number 234, 235 & 238. Calculate the number of neutrons in their nuclei.

16 . Why Dalton's atomic theory is considered as a base of modern atomic concepts?

17 . Summarize Rutherford's atomic model of an atom and explain how we developed this.  
Model based on result of his famous gold-foil experiment

18 . State the postulates which Bohr suggested to overcome the short comings of Rutherford's atomic Model?

19 . Complete the following table for neutral atoms of specific isotopes:

20 .

Define the modern periodic law. Discuss the periods and groups in the modern form of the periodic table.

21 .

Define and explain the ionization energy of an elements. Discuss the periodic variation energies of the elements in the periodic table.

22 . What do you mean by Electron affinity of an elements? Discuss its periodic variation in the table.

23 .

Define the electro negativity of an element. Discuss its periodic variation in a period and in a group in the periodic table?

24 . How modern periodic table is different from Mendeleev periodic table?

25 .

What is electronegativity? Identify the most and least electronegative groups of elements in the periodic table. Why fluorine is special in terms of electronegativity?

26 . Define shielding effect and its affects the ionization energy, electron affinity and electronegativity?

27 . Explain the following terms:

a. Periodicity of Properties.

- b. Electron affinity.
- c. Modern periodic law.

28 . Write the two concepts which explain the chemical bonding.

29 . Define ionic bond. Explain ionic bond formation in NaCl and CaCl<sub>2</sub>.

30 . Define covalent bond and explain its types in detail.

31 . Define co-ordinate covalent bond.

32 . What is meant by Lewis structure?

33 . What is metallic bond?

34 . Draw the shapes of molecules:

35 . What is intermolecular forces? Explain with reference to example.

36 . Explain Dipole-Dipole interaction in detail.

37 . What do you understand from Hydrogen bonding?

38 . Write a note on Application and properties of Hydrogen Bonding.

39 . Write the properties of ionic compounds?

40 . Write the properties of covalent compounds.

41 . Write a note on properties of metals.

42 .

What is the main distinction between ionic and covalent bonding? Explain your answer with suitable examples.

43 .

How is electronegativity used in determining the ionic or covalent character of the bonding Between two elements?

44 . Draw the Lewis structure for each of the following compounds.

- a. CO
- b. HCl
- c. SO<sub>2</sub>
- d. CCl<sub>4</sub>
- e. BF<sub>3</sub>
- f. NH<sub>3</sub>

45 . Explain why most metals are malleable and ductile but ionic crystals are not.

46 . What is meaning of the term polar, as applied to chamil bonding?

47 . Write the typical properties of gases.

48 . State and explain diffusion in gases.

49 . State and explain Evaporation. What are factors affecting rate of evaporation?

50 . What is vapor pressure? What are the factors which effect the vapor pressure?

51 .

Write the typical properties of solids.

52 . What is Allotropy? Why elements show allotropy? Give example.

53 . Differentiate between.

- a. Evaporation and Boiling point.
- b. Effusion and Diffusion of gases.
- c. Condensation and Evaporation.

54 . Define the term allotropy with examples. Explain the three allotropes forms of carbon in detail.

55 . What are solids? Differentiate between amorphous and crystalline solids.

56 .

Calculate the final pressure of the sample of gas that is changed at constant temperature to  $14.3 \text{ dm}^3$  from  $7.5 \text{ dm}^3$  at 828 torr.

57 .

Calculate the final volume at 302 k of  $5.41 \text{ dm}^3$  sample of gas originally at 353 k if the pressure does not change

58 .

A sample of a gas at room temperature occupies  $0.80 \text{ dm}^3$  at 1.5 atm. What will be its volume when the pressure of the gas is raised to 2.1 atm?

59 .

Calculate the final volume of  $319^0 \text{ C}$  of a sample of gas  $5.13 \text{ dm}^3$  at  $171^0 \text{ C}$ , if the pressure does not change.

60 . Write note on:

- (a) Solution (b) Solute (c) Solvent

61 . Define the following:

- i. Aqueous Solution ii. Binary Solution
- iii. Dilute Solution iv. Concentrated Solution

62 . What is a solute-solvent interaction? Explain these interactions on the basis of solute and solvents.

63 . Define and explain with example.

- i. Suspension ii. Colloidal Solution

64 . Write the properties of solution, colloids and suspensions.

65 . Define solution? Explain types of solution on the basis of states of matter.

66 . Discuss the solubility of a substance?

67 . Explain the factors that are responsible for the solubility of a substance?

68 . What is the difference between a concentrated and dilute solutions? Give example of each.

69 . Differentiate between unsaturated, saturated and supersaturated solutions.

70 .

Describe one way to prove that a mixture of sugar and water is solution and that a mixture of sand and water is not a solution.

71 . Explain the following concentration units.

    a. Percentage composition b. Molarity

72 . What is oxidation number? What are the rules of assigning oxidation number?

73 . What is the oxidation state of C in  $\text{CO}_2$ , O in  $\text{CO}_2$ , Sn in  $\text{SnCl}_4$  and S in  $\text{K}_2\text{SO}_4$ ?

74 . What is oxidizing and reducing agents? Explain with examples.

75 . What are the oxidation and reduction reactions?

76 . What are electrochemical cells? Explain electrolytic cell in detail.

77 . What is galvanic or Voltaic cell? Explain in detail.

78 . Define electrolytes, Non electrolytes and electrodes.

79 . What is battery? Explain dry cell.

80 . Write a note on zinc plating, chrome plating and tin plating.

81 . What is electroplating?

82 . Distinguish between the nature of the anode and cathode in such a process.

83 . Differentiate between the process of oxidation and reduction. Write an equation to illustrate each.

84 . What is corrosion? Explain the rusting of iron as an example of corrosion.

85 . Differentiate between electrolytic cell and Galvanic cell.

86 . Discuss the method of recovering/extracting of metal from its ore.

87 .

Discuss the preparation of Sodium Hydroxide ( $\text{NaOH}$ ) from brine along with diagram and reactions at cathode and anode.

88 . What are Alkali Metals? Also explain occurrence of alkali metals.

89 . What are Alkaline earth Metals? Also explain occurrence of alkaline earth metals.

90 .

What is the difference in the reactivities of Group I and Group II elements? Describe with Respect to the variation in atomic number and ionization potential.

91 . Describe the position, properties and uses of Sodium.

92 . Write the position, properties and uses of Magnesium and Calcium.

93 . What are Soft and Hard metals?

94 .

Write a note on commercial value of silver (Ag), Platinum (Pt) and Gold (Au)?

95 . Write the electronegative characters of non-metals.

96 . Compare and contrast the properties of alkali and alkaline earth metals, with reactions.

97 . Differentiate between soft and hard metals

98 . Give the reaction of magnesium with: i.  $H_2$  ii.  $HCl$  iii.  $O_2$  iv.  $H_2O$  v.  $Cl_2$

99 .

Discuss the reasons why some elements exist as free elements in nature while others occur in combined states as compounds. Give two examples of each.

100 . Halogens are very reactive elements, write down halogen's reactions with hydrogen, oxygen, metals, non-metals and other compounds along with displacement reaction.

