

### Short Answer Type (VSA) (1 Mark each)

1. Which of the two: HCl or  $\text{CH}_3\text{COOH}$  is a strong acid?
2. What is an olfactory indicator? Give one example.
3. Give two examples of strong bases.
4. Write a general equation for the reaction of a metal carbonate with an acid.
5. What is the basicity of  $\text{CH}_3\text{COOH}$ ?
6. Is the sting of ants acidic or basic?
7. Give two examples of weak acids.
8. What is the acidity of aluminium hydroxide?
9. Will the pH of milk of magnesia less than or more than 7?
10. Name the acid and base from which the salt  $\text{CuSO}_4$  has been derived.
11. What is the chemical formula of washing soda?
12. Dissolution of an acid in water is ..... thermic reaction. Complete the statement.
13. What is the pH of a neutral solution?
14. Give one example each of a strong acid and a strong base.
15. Is  $\text{CH}_3\text{COOH}$  strong or weak acid? Will its 0.1 M solution have pH more or less than HCl of same concentration?
16. 10 mL of 0.1 M HCl solution reacts completely with 10 mL of 0.1 M NaOH solution. What will be the pH of the resulting solution?
17. The pH of same concentration of gastric juice and lemon juice are 1.5 and 2.4 respectively. Which is more acidic?

18. The pH of a solution is 6. What is hydrogen ion concentration?
19. Which of the following has larger pH value (i) 1M HCl (ii) 1M NaCl (iii) 1M NaOH?
20. Write the common name of  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ . Give its one use.
21. Name a sodium compound used for softening hard water.
22. What happens when bleaching powder is exposed to air?
23. What is gypsum? What happens when gypsum is heated to 373 K?
24. Give two uses of bleaching powder.
25. Name the compound which is used for setting fractured bones. Write its chemical name and formula.
26. Write an equation to show the reaction between Plaster of Paris and water.
27. What is neutralization reaction? Give one example.
28. How does the pH of an acid solution change when it is diluted?
29. Will the solution of sodium carbonate acidic or basic?
30. An acid solution has pH.... than 7 and changes ... litmus solution ... Complete the statement.

### Short Answer Type-I (SA-I) (2 Marks each)

1. What do all acids and all bases have common? Explain.
2. Why does an acid solution conduct electricity?
3. Explain the following :
  - (i) Distilled water does not conduct electricity.
  - (ii) Acids donot show acidic behaviour in the absence of water.

**Short Answer Type-II (SA-II) (3 Marks each)**

- Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd?
- What is efflorescence? Name one compound which shows efflorescence. Support your answer with reaction.
- State important properties of washing soda.
- What is washing soda? What is the action of heat on it.
- What is gypsum? What happens when gypsum is heated to 373 K?
- What is the action of heat on
  - Washing soda
  - Lime stone
- Describe with chemical equations what happens when:
  - Carbon dioxide gas reacts with ammoniacal brine
  - Bleaching powder is left exposed to air containing carbon dioxide.
- Explain giving reasons
  - Tartaric acid is an important constituent of baking powder used in making cakes.
  - Baking soda is used in soda-fire extinguisher
- Write the chemical formula of washing soda. What happens when crystals of washing soda are exposed to air?
- What will happen if the solution of sodium hydrogen carbonate is heated? Give the equation of the reaction involved.
- What is bleaching powder? What are its uses?
- Doctors use a paste of white substance in water to maintain a fractured bone fixed in its place. Identify this substance and write its chemical formula.
- Name the substance obtained by action of chlorine on dry slaked lime. Write chemical equation of the reaction.
- A white powdered solid when added to water produces hissing sound. Identify the compound. How does this compound react with moist hydrogen chloride gas? Write the chemical equation.
- Describe an activity to show that acidic solution conducts electricity.
- Among HCl, H<sub>2</sub>SO<sub>4</sub> and CH<sub>3</sub>COOH, \_\_\_\_\_ is weak acid.
  - Potassium nitrate has pH value equal to \_\_\_\_\_
  - Washing soda has chemical formula \_\_\_\_\_
  - Plaster of Paris is obtained by heating \_\_\_\_\_

- What are strong and weak acids and bases? Give two examples of each.
- What are acids? Describe an activity to show the reaction of acids with metals.
- How do acids and bases, react with each other. Explain with example.
- Discuss the role of pH in
  - digestive system
  - causes of tooth decay
  - plants and animals are pH sensitive
- Define pH. Which of the following salts will have pH more than 7?
  - Zinc sulphate
  - Sodium acetate
  - Potassium nitrate
- Complete the following reactions:
  - Sodium hydroxide + ..... acid  $\longrightarrow$  Sodium chloride + Water
  - Copper oxide + Sulphuric acid  $\longrightarrow$  ..... + .....
  - Sodium carbonate + ..... acid  $\longrightarrow$  Sodium nitrate + ..... + .....
  - Ca(OH)<sub>2</sub> (aq) + .....  $\longrightarrow$  CaCO<sub>3</sub>(s) + .....
  - Sodium hydrogen carbonate + .....  $\longrightarrow$  Sodium chloride + ..... + .....
  - Aluminium + Sulphuric acid  $\longrightarrow$  ..... + .....
- Comment on the following:
  - All alkalies are bases but all bases are not alkalies.
  - Acetic acid is monobasic though it contains four H atoms.
  - Distilled water does not conduct electricity while acid rain water does.
- What happens when acids are added to the following? Give at least two equations in each case:
  - Carbonates
  - Hydrogen carbonates
  - Hydrogen sulphates
- How is bleaching powder prepared? Give its three uses.
- What is washing soda? Give two important uses of washing soda.
- What is baking soda? Give two important uses of baking soda.
- What happens when

ACTIVITY

- (i) Bleaching powder reacts with dilute sulphuric acid ?
  - (ii) Slaked lime reacts with chlorine ?
  - (iii) Sodium hydrogen carbonate is heated ?
  - (iv) Gypsum is heated ?
13. What is alk-chlor process ? Name its three major products and give one use of each.
14. What is bleaching powder ? How is it prepared? How does it react with
- (i)  $\text{CO}_2$  ?
  - (ii) dil HCl ?
15. Complete the reaction:
- $$\text{Ca(OH)}_2 + \text{Cl}_2 \longrightarrow$$
- $$\text{CaO} + \text{H}_2\text{O} \longrightarrow$$
- $$\text{NaHCO}_3 \xrightarrow{\text{Heat}}$$
16. (a) Acids turn ..... litmus solution .....
- (b) Acid + Metal a salt + .....
  - (c) pH of acid solution is always ..... than 7.
  - (d) According to Arrhenius concept NaOH is base because it gives ..... ions.
  - (e) pH of  $10^{-5}$  M HCl solution is .....
  - (f) HCl behaves as an acid because it turns ..... litmus solution .....

**Long Answer Type (L.A) (5 Marks each)**

1. Describe an activity to show how do metal carbonate and hydrogen carbonates react with acids. Give equations for one reaction in each case

2. What is pH ? Discuss the role of pH in every day life?
3. Discuss method of preparation and two uses of each of the following :
- (i) Plaster of Paris
  - (ii) Washing soda
  - (iii) Bleaching powder
4. Explain the following with remedy
- (i) Feeling of acidity after overeating
  - (ii) too much acidic soil
  - (iii) tooth decay due to eating sugary substances
  - (iv) self defence by animals and plants through chemical warfare.
5. (i) What are acids and bases? Give two tests to distinguish these.
- (ii) How do they differ in their reactions with metals ?
  - (iii) What happens when they react with each other ?
6. What is neutralisation reaction ? Give some important applications of neutralization reactions.
7. Give method of preparation and two uses of each of the following :
- (i) Bleaching powder
  - (ii) Sodium hydroxide

### Very Short Answer Type (VSA) (1 Mark)

1. State Newlands law of octaves.
2. What is the main necessity of classifying the elements?
3. State Mendeleev's periodic law.
4. What is meant by a group and a period in the periodic table?
5. Write the names and symbols for three halogen atoms.
6. What is modern periodic law?
7. How many periods are there in the long form of the periodic table?
8. What is the number of elements in the first four periods of the long form of the periodic table?
9. Rewrite the following statements after corrections (if necessary):
  - (i) Groups have elements with same number of electrons.
  - (ii) Isotopes are the elements of same group.
10. What are normal elements?
11. How do the atomic radii change with increasing atomic number in a period?
12. Why do the elements in a same group have generally similar properties?
13. The atomic radii of elements decrease across a period from left to right. Justify.
14. What was Dobereiner's basis of classification of elements?
15. How many periods and groups are there in the long form of the periodic table?
16. An element of group 14 has an atomic number 14. Examine if this element will have metallic or non-metallic properties.
17. What is periodicity?
18. Out of Li, Na and K, which has the largest atomic size?
19. How were the positions of cobalt and nickel resolved in the Modern Periodic Table?

### Short Answer Type-I (SA-I) (2 Marks)

1. Define modern periodic law. How many groups and periods are there in the long form of the periodic table?
2. What is meant by Dobereiner's triads? Give one example.

3. What is meant by valency of an element? Give the valency of Mg and Al.
4. Define atomic radius. Which of the two - B or C has smaller atomic radius?
5. Give example of the following:
  - (i) Fourth element of second period.
  - (ii) Third element of group 13.
6. What is metallic character? How does it change in a group and a period?
7. Why is silicon tetravalent while chlorine is monovalent?
8. Why does the size of the atom progressively become smaller from Na to Cl?
9. Name one alkali metal and one alkaline earth metal starting with letter S.
10. Define modern periodic law. Why was it necessary to change its basis of classification from atomic masses to atomic number?
11. How does electropositive character vary in third period of the periodic table?
12. Explain why the properties of the 8th element are repeated in case of elements arranged in 2nd and 3rd period of long form of the periodic table.
13. Name two elements whose atoms are readily converted to unipositive ion.
14. Argon has atomic number 18 and belongs to third period and zero group. Predict the group and period for the elements having atomic number 17 and 19 respectively.
15. Which of these belong to (i) same period and (ii) same group:

Element	Atomic number
A	2
B	10
C	5

16. What is periodicity? What is the cause of periodicity?
17. Fill in the blanks:
  - (i) The horizontal rows in the periodic table are called .....
  - (ii) According to modern periodic law, the properties of the elements are periodic function of their .....

- (iii) The number of periods in the long form of the periodic table is .....
- (iv) In a period; the metallic character ..... with the increase in atomic number.
18. What is the basic difference in the electronic configurations of the elements belonging to group 1 and group 17? How do these help to explain different properties of the elements?
19. (i) What is metallic character? How does it change in a period?  
 (ii) How do atomic radii change in a period and in a group?
20. An atom has the electronic configuration 2, 8, 7.  
 (a) What is the atomic number of the element?  
 (b) To which of the following element would it be chemically similar (atomic numbers are given)?  
 N(7), F(9), P(15), Ar(18).

**Short Answer Type-II (SA-II) (3 Marks)**

- What are the main contributions of Mendeleev's classification towards the development of chemistry?
- Why is long form of the periodic table regarded better than Mendeleev's periodic table?
- List some drawbacks of Mendeleev's periodic table.
- An element X belongs to group I and third period of the periodic table. Find out :  
 (i) electron arrangement. (ii) metal or non-metal.  
 (iii) name of the element.
- Which has the larger atomic radius?  
 (i) Na or K (ii) F or Cl  
 (iii) S or P (iv) O or S.
- Define:  
 (i) Modern periodic law. (iii) Valency.  
 (ii) Atomic size.
- Nitrogen ( $Z = 7$ ) and phosphorus ( $Z = 15$ ) belong to group 15 of the periodic table. Write the electronic configuration of the two elements in terms of K, L and M shells. Predict whether these are metallic or non-metallic.
- Explain the variation of atomic size in a group and along a period.
- Define atomic size Define modern periodic law. What is the main difference between this and Mendeleev periodic law?
- Discuss the variation of the following in a period :  
 (i) Atomic radius  
 (ii) Metallic character (iii) valency
- Complete the missing statements :  
 (a) ..... belongs to group 2.  
 (b) Halogens belong to ..... group.

- In a group atomic radii ..... from top to bottom and in a period atomic radii..... from left to right.
  - There are ..... groups in the modern periodic table.
  - A very short period contains ..... elements.
  - The element having electron configuration (2, 8, 3) belongs to ..... group.
12. Answer the following :
- Electronic configuration of second alkali metal.
  - One other element of the group to which Al belongs?
  - Metalloid element belonging to the same period to which germanium belongs.

**Long Answer Type (LA) (5 Marks)**

- What is modern periodic law? Describe briefly the long form of the periodic table.
- The following elements represent third period of the periodic table :  
 Na Mg Al Si P S Cl Ar  
 Answer the following :  
 (a) Which of these has electron configuration 2, 8, 4?  
 (b) Which of these is :  
 (i) Alkaline earth metal  
 (ii) Noble gas?  
 (c) Which of these has smallest size and which has the largest size?  
 (d) Which of the two P or Cl has more non-metallic character?  
 (e) Which of these has highest ionisation energy?
- Give symbols for :  
 (a) a metal belonging to the second group of the periodic table.  
 (b) two non-metals belonging to halogen family.  
 (c) the most active halogen.  
 (d) the first noble gas in the periodic table.  
 (e) a metal belonging to third period of the periodic table.
- The following table represents a period in the periodic table with hypothetical symbols for the elements :  

Group	1	2	13	14	15	16	17	18
Element	A	B	C	D	E	F	G	I

 (a) Which element has the highest atomic number?  
 (b) Which is the most inactive element?  
 (c) Which element has the strongest metallic character?  
 (d) Arrange the elements C, D, E and F in the decreasing order of their atomic radii.

5. The position of three elements X, Y and Z in the periodic table is given below :

Group 16	Group 17
—	—
—	Y
—	—
X	Z

- State whether Z is a metal or a non-metal.
- Will Z be larger or smaller than Y?
- Which type of ion, cation or anion will be formed by element Z?
- Will Z have smaller or larger ionisation energy than Y?

6. A part of periodic table is given below. The elements lithium, carbon, sulphur and argon have been placed in their correct position. The positions of other elements are represented by hypothetical letters.

1	2	13	14	15	16	17	18
Lithium	A	B	Carbon	C	D	E	F
I			G		Sulphur	L	Argon
J		H				M	
K						N	

with reference to this table, answer the following :

- Which of these has smallest radius?
- Which of these has electronic configuration (2, 8, 4)?
- What is the electron arrangement of J?
- Name the family of elements represented by E, L, M and N.
- Which of these is an alkaline earth metal?
- Arrange C, D and E in the increasing order of their atomic radii.