

S.S.L.C. EXAMINATION, MARCH-2012
CHEMISTRY

Time : 1½ Hours

Total Score : 40

Instructions :

- Answer all questions.
- First 15 minutes are given as 'cool off time' in addition to 1½ hours. Use this time to read and understand the questions.
- Answer the questions only after reading and understanding the questions thoroughly.
- Manage the time to answer the questions.
- Score for each question is given against each question.
- Questions with choice are included for such questions answer only one question.
- Write the question numbers for main and subquestions correctly.

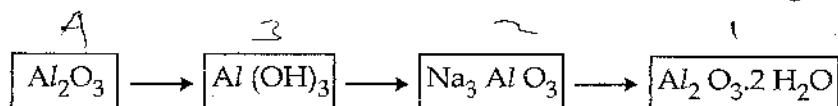
Score

- ①. A d-block element iron (Fe) forms two types of compounds, FeSO_4 and $\text{Fe}_2(\text{SO}_4)_3$.
- (a) Which of these compounds contains ferric (Fe^{3+}) ion? 1
- (b) What is the number of electrons present in the d - subshell of Fe^{3+} ion? Find out by writing the subshell electronic configuration. 2
- [Given : Atomic number of Fe is 26]
- ②. Two chemical reactions are given :
- (i) Sulphur dioxide combines with Oxygen to form Sulphur trioxide.
- (ii) Sodium reacts with water.
- (a) Write the balanced chemical equation for any one of the above reactions 1
- (b) Which of the above reaction is a reversible reaction? 1
- (c) What is the effect of pressure and temperature on this reversible reaction? Give reason. 2

P.T.O.

3. Alnico is an alloy used to make permanent magnets.

- (a) Which is the metal present in Alnico in addition to iron, nickel and cobalt? 1
- (b) Compounds in the process of extraction of aluminium are given 1



If there is any mistake in the order of the compounds, write them in the correct order.

- (c) "To extract Al from its ore, carbon is not used as a reducing agent". Justify the statement. 1

4. [This question has choice. Write answer for any one question]

Some data about three gases at STP are given :

(A) 16 g CH_4

(B) 11.2 L CO_2

(C) 6.022×10^{23} molecules of NH_3 .

- (a) The number 6.022×10^{23} is known as _____. 1
- (b) Calculate the number of CH_4 molecules present in 16 g CH_4 . 1
- (c) Arrange A, B and C in the increasing order of mass in gram. 2

[given : At mass : H=1, C=12, N=14, O=16]

OR

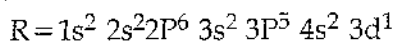
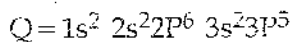
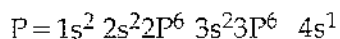
A, B and C are three cylinders of volume 11.2 L each. H_2 , O_2 and N_2 gases at STP are filled in A, B and C respectively.

- (a) Find the number of moles of H_2 molecules in A. 1
- (b) Calculate the number of molecules of O_2 present in B. 1
- (c) If the volume of N_2 present in C is doubled at STP, calculate the mass in gram of N_2 gas. 2

[given : Molar volume at STP = 22.4 L, At. mass : H=1, O=16, N=14]

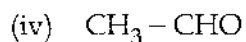
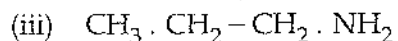
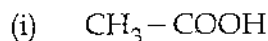
5. Subshell electronic configuration of elements P, Q and R are given.

[P, Q and R are imaginary symbols]



- (a) One of these electronic configurations given above is wrong. Which is the element? 1
- (b) Out of P, Q and R, which has highest electronegativity? 1
- (c) Can P and Q join to form an ionic compound? Justify your answer. 2

6. Given below are some organic compounds containing certain functional groups.



- (a) Write the names of functional group of any of the two compounds given above. 1
- (b) Write the IUPAC name of 1
- $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$.
- (c) Give the structural formula and IUPAC name of functional group isomer of 2
- $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$.

Score

7. Two group of students (A and B) are conducting two experiments

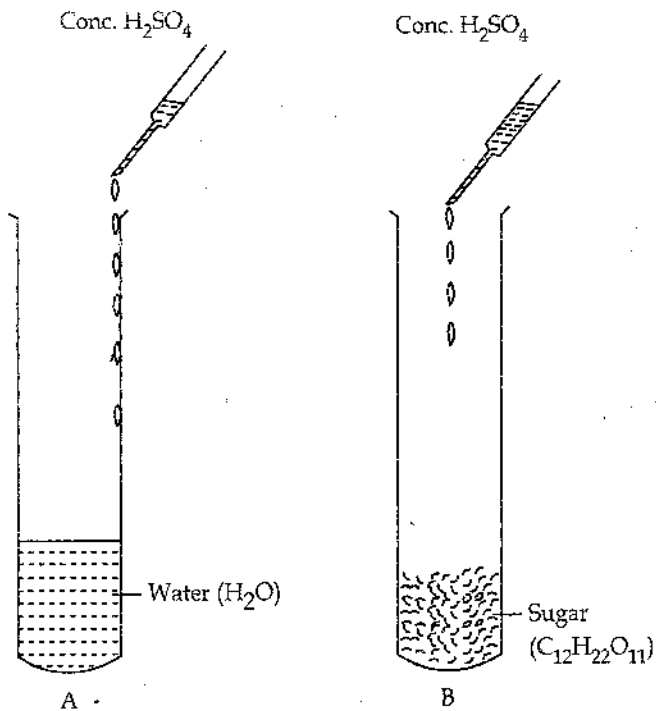
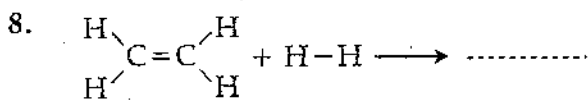


Fig. 1

- (a) Write true or false :

"The experiment which is conducted by group A is related to the chemical property of H₂SO₄" 1

- (b) Instead of sugar if common salt (NaCl) is taken in the test tube in the experiment of group B, which acid will form ? 1



- (a) Complete the reaction 1

- (b) Name the product formed if a large number of CH₂=CH₂ molecules are added instead of H-H. 1

9. Mg, Al, Zn, Fe and Ag are metals of reactivity series :
- (a) Which of these metal shows highest reactivity? Mg 1
- (b) If an electrochemical cell is devised by dipping Fe in $FeSO_4$ solution and Ag in $AgNO_3$ solution, which electrode is acting as cathode? Give reason. Fe 2

10. Substances used in two different projects done by the members of a science club are given in the table :

Project - 1	Project - 2
<ul style="list-style-type: none"> • Ethanoic acid • Ethanol • Concentrated sulphuric acid ✓ • Water 	<ul style="list-style-type: none"> • Coconut oil • Sodium hydroxide • Water

- (a) In which project (Project - 1 or Project - 2) a compound with pleasant fruity smell is formed? 1
- (b) How will you distinguish between distilled water and hard water by using the precipitate formed in project - 2? 2

11. Given below is the part of a graph

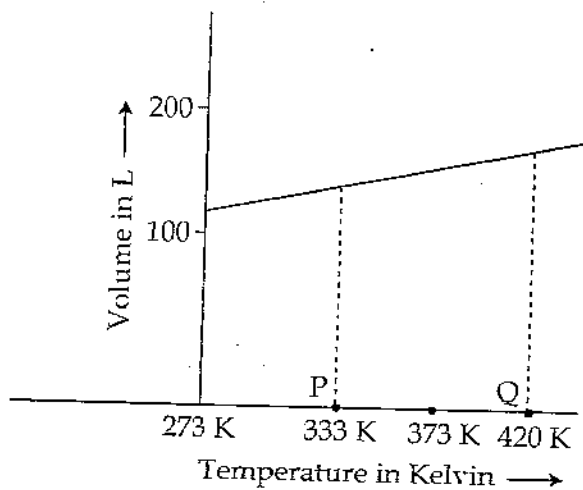


Fig. 2

- (a) Which gas law is related to this graph? 1
- (b) Convert the values of temperature at 'P' and 'Q' given in Kelvin scale (K) to degree celsius scale ($^{\circ}C$). 1
- (c) Calculate the temperature in Kelvin scale at which volume of a gas at $50^{\circ}C$ becomes double (Hint : in both situations pressure is same) 2

These receive

Score

2

12. Some substances and their uses are given in the table : Match them suitably.

Substance	Use
• Antacids	• Pesticide 5
• Benedicts solution	• To test glucose 2
• Thermosetting Plastics	• To give blue colour to glass 4
• Cobalt Oxide	• To make switch board 3
• Tobacco extract	• To reduce acidity 1

13. 2011 is the International year of chemistry. "Chemistry is our life, our future", is the motto. 2
"Chemistry is not a problem but a solution" is the message of green chemistry. Explain the relevance of this message.