

S.S.L.C. EXAMINATION, MARCH - 2018

CHEMISTRY

(English)

Time : 1½ Hours

Total Score : 40

General Instructions :

- First 15 minutes is cool-off time.
- Read all the instructions carefully.
- Questions with scores 1, 2, 3 and 4 are categorised separately.
- 5 questions are given in each category. Answer **any four** from each category.
- Answer each question by keeping time.

Score

(Answer any 4 questions from 1 to 5. Each question carries 1 score.)

1. The number of moles in 400 g CaCO_3 is _____.
[Hint : Gram atomic masses : Ca = 40 g, C = 12 g, O = 16 g]
2. Which of the following is a reversible reaction ?
A : $\text{NaCl(aq)} + \text{AgNO}_3\text{(aq)} \rightarrow \text{NaNO}_3\text{(aq)} + \text{AgCl(s)}$
B : $\text{NH}_4\text{Cl(s)} \rightleftharpoons \text{NH}_3\text{(g)} + \text{HCl(g)}$
3. Find the relation and fill in the blank.
Amino group : $-\text{NH}_2$
Carboxylic group : _____
4. Which colour is given by cobalt oxides to glass ?
5. The medicines which relieve pain are called _____.

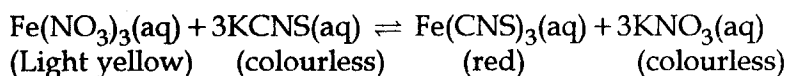
(Answer any 4 questions from 6 to 10. Each question carries 2 score.)

6. The balanced chemical equation for the formation of ammonia gas by the reaction between nitrogen gas and hydrogen gas is given.
 $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
(a) Write the ratio between the number of moles of reactants and products in the correct order.
(b) How many moles of ammonia are formed when 6 moles of N_2 react with 6 moles of H_2 ?

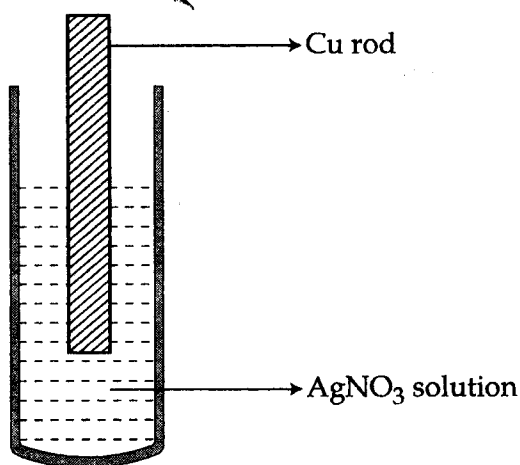
7. (a) Which of the following statements is correct about chemical equilibrium ?

- (i) At equilibrium both the reactants and products coexist.
- (ii) At equilibrium the rate of forward reaction is greater than the rate of backward reaction.

(b) Write any one activity to increase the red colour in the following reaction.



8. Observe the diagram showing a copper rod kept immersed in silver nitrate solution.



- (a) What is the colour change of the solution ?
- (b) Write the balanced chemical equation for the reaction.

9. (a) Write an example for a metal which can be refined by liquation ?

(b) What is calcination ?

10. Esters are obtained by the reaction between alcohols and carboxylic acids.

(a) Write the chemical formula of ethyl ethanoate.

(b) Write the chemical equation for the formation of ethyl ethanoate.

(Answer any 4 questions from 11 to 15. Each question carries 3 score.)

11. (a) What is gram atomic mass ?
 (b) Calculate the following :
 (i) How many gram atoms of sodium is present in 115 g sodium ?
 (ii) Mass of 5 gram atoms of calcium.
 [Hint : Gram atomic masses : Na = 23 g, Ca = 40 g]
12. The outermost shell electronic configuration of an element 'A' (symbol given is not real) is $3s^2 3p^4$.
 (a) To which period of the periodic table does this element belong to ?
 (b) Find the group number of the element.
 (c) Which is the block to which the element belongs ?
13. What happens to the rate of the forward reaction of the equilibrium,
 $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g) + \text{Heat}$ during the following situations ?
 (a) increase in temperature
 (b) SO_3 is removed
 (c) pressure is decreased
14. (a) What are isomers ?
 (b) Write the structural formulae of any two position isomers of an alcohol with molecular formula $C_5H_{12}O$.
15. Petroleum is a mixture of different hydrocarbons.
 (a) Which method is used for separating the components of petroleum ?
 (b) Which is the hydrocarbon present in liquified petroleum gas (LPG) ?
 (c) Write any two environmental issues caused by the excessive consumption of fossil fuels.

(Answer any 4 questions from 16 to 20. Each question carries 4 score.)

16. There are sub shells in shells around the nucleus.
 (a) What is the maximum number of electrons that can be accommodated in d-sub shell ?
 (b) Write the possible sub shells in 3rd shell in the increasing order of energy.
 (c) Which of the following is the outermost electronic configuration of copper ?
 (Atomic number = 29)
 A : $3d^9 4s^2$
 B : $3d^{10} 4s^1$
 Justify your answer.

17. Ions are the current carriers in electrolytes.
- Sodium chloride in solid state is not an electrical conductor, but molten sodium chloride can conduct electricity. Give reason.
 - What are the products obtained at anode and cathode during the electrolysis of molten sodium chloride ?
 - If the aqueous solution of sodium chloride is subjected to electrolysis, what are the products obtained at each electrode ?
18. Different methods are used for the concentration of ores.
- What is the ore of aluminium ?
 - Explain how the ore of aluminium is concentrated by leaching.
19. Organic compounds are obtained through different chemical reactions.
- What is the difference between substitution reactions and addition reactions ?
 - Complete the following reactions :
 - $\text{CH}_3 - \text{CH}_3 + \text{Cl}_2 \rightarrow \text{-----} + \text{HCl}$
 - $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_3 + \text{HI} \rightarrow \text{-----}$
20. The structural formulae of some organic compounds are given below :
- $\text{CH}_3 - \text{CH}_2 - \text{CO} - \text{CH}_3$
 - $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CHO}$
 - $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{OH}$
 - $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
- Which of these is an alkane ?
 - Write the structural formula of the position isomer of the third compound.
 - Which of the given compounds are functional isomers ?
 - Write the structural formula of the chain isomer of the fourth compound.