SSLC MODEL EXAMINATION, MARCH - 2022

CHEMISTRY

(English)

Time : 1½ Hours | Total Score : 40

Instructions :

- There is a 'Cool-off time' of **15** minutes in addition to the writing time. Use this time to get familiar with questions and to plan your answer.
- Questions with different scores are given as distinct parts.
- Read the instructions carefully before answering the questions.
- Keep in mind, the score and time while answering the questions.
- The maximum score for questions from **1** to **24** will be **40**.

Score

PART - I

Questions from 1 to 9 carry 1 score each.

A. Answer any 4 questions from 1 to 6. **4x1=4**

1. Which Subshell is common to all shells ? 1

2. The number of molecules present in 1 GMM N_2 is _____. 1

3. Which one of the following metals react with hot water ? 1
   [Au, Cu, Ag, Mg]

4. Fill up suitably : 1
   $-OH$: Hydroxyl group
   $-COOH$: _____

5. Complete the given chemical equation. 1
   $NH_4Cl \rightarrow$ _____ $+ HCl$

6. Which is the method used to concentrate Sulphide ores ? 1

P.T.O.

Score

B. **Answer all questions from 7 to 9.** 3x1=3

7. In f-block elements, the last electron is filled in _____ subshell. 1

8. Which substance is deposited at the Cathode, when molten Sodium Chloride is electrolysed ? 1

   [Oxygen, Chlorine, Sodium, Hydrogen]

9. In electrolytes _____ are responsible for the conduction of electricity. 1

PART - II

Questions from 10 to 12 carry 2 scores each.

A. **Answer the following question.** 1x2=2

10. (a) Which of the following chemicals are used to prepare ammonia (NH_3) in the laboratory ? 1

    [NaCl, $Ca(OH)_2$, $CaCl_2$, NH_4Cl]

    (b) Ammonia gas produced is passed through quick lime. Give reason. 1

B. **Answer any one question from 11 to 12.** 1x2=2

11. The volume of 1 mole of any gas at STP is 22.4 L. What will be the volume of 34 g NH_3 at STP ? 2

    [1 GMM NH_3 = 17 g]

12. Copper is electroplated on an iron ring.

    (a) Which electrolyte is used here ? 1

    (b) Which metal is connected to the positive terminal of the battery ? 1

PART - III

Questions from 13 to 17 carry 3 scores each.

A. **Answer any three questions from 13 to 16.** 3x3=9

13. Match columns **A**, **B** and **C** suitably : 3

A Alloy steel	B Property	C Use
Stainless steel	High resistance	For the manufacture of permanent magnets
Nichrome	Magnetic nature	For the manufacture of utensils
Alnico	Hard	For making heating coils

Score

14. In element A (Symbol is not real), the last two electrons are added to the 4s subshell.

(a) Write down the subshell electronic-configuration of A. 1

(b) Which period does it belong to ? 1

(c) Find its group number. 1

5. $N_{2(g)} + 3H_{2(g)} \; f \; 2NH_{3(g)} + \text{Heat}$

How do the following changes affect rate of forward reaction in the given system at equilibrium ?

(a) Pressure is decreased 1

(b) Temperature is increased 1

(c) More H_2 is added 1

16. Choose the name of reaction from the given box and complete the table.

Substitution reaction, Thermal Cracking, Addition reaction, Combustion, Polymerisation

Chemical equation	Name of reaction
$CH_2 = CH_2 + H_2 \rightarrow CH_3 - CH_3$	———
$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$	———
$CH_3 - CH_3 + Cl_2 \rightarrow CH_3 - CH_2 - Cl + HCl$	———

B. Answer the following question. 1x3=3

17. Examine the following compounds and answer the questions.

(i) $CH_3 - O - CH_3$

(ii) $CH_3 - CH_2 - CH_2 - OH$

(iii) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

(iv) $CH_3 - CH_2 - OH$

(a) Find out the isomeric pairs. 2

(b) Which is the functional group of $CH_3 - O - CH_3$? 1

Score

PART - IV

Questions from 18 to 22 carry 4 scores each.

A. Answer any two questions from 18 to 20. 2x4=8

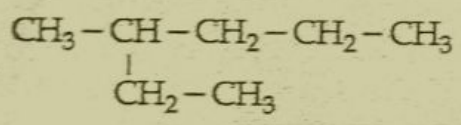
18. The relation between pressure and volume of a fixed mass of gas at constant temperature is given in the table.

Pressure (P) atm	Volume (V) L	P × V
1	200	200
2	(a)	200
(b)	50	(c)

(a) Find the values of a, b and c.

(b) Which gas law is applied here ? 1

19. The structural formula of a hydrocarbon is given :



(a) Write the molecular formula of the given hydrocarbon. 1

(b) How many carbon atoms are there in the longest carbon chain ? 1

(c) Name the branch present. 1

(d) Write its IUPAC name. 1

20. The following chemical equations represent the reactions taking place in the blast furnace during the manufacture of iron.

- $C + O_2 \rightarrow CO_2 + Heat$
- $CO_2 + C + Heat \rightarrow 2CO$
- $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$
- $CaCO_3 \rightarrow CaO + CO_2$
- $CaO + SiO_2 \rightarrow CaSiO_3$

(a) Which is the ore of iron used in the blast furnace ? 1

(b) Which substance acts as the reducing agent in this process ? 1

(c) What is the role of CaO in this process ? 1

(d) Which one of the given chemical equations represent slag formation ? 1

B. Answer any one question from 21 to 22. Score 1x4=4

21. Choose the correct answer from the box.

Ethanoic acid, Sodium hydroxide, Methanol, Glycerol, 95.6% Ethanol

(a) Which alcohol is known as wood spirit ? 1

(b) Which substance is known as rectified spirit ? 1

(c) Name the acid present in vinegar. 1

(d) Which is the bye-product in the manufacture of soap ? 1

22. A few drops of concentrated sulphuric acid is added to sugar.

(a) What do you observe ? 1

(b) Which property of concentrated sulphuric acid is shown here ? 1

(c) Why concentrated sulphuric acid is not used as a drying agent in the preparation of ammonia ? 1

(d) Which substance is used to identify sulphate salts ? 1

($NaCl$, KCl, $BaCl_2$, $BaSO_4$)

PART - V

Questions from 23 to 24 carry 5 scores each.

A. Answer any one question from 23 to 24. 1x5=5

23. The atomic number of an element X is 13. (Symbol is not real)

(a) Write down the subshell electronic configuration of element X. 1

(b) Write down its subshell electronic configuration using the symbol of preceding noble gas. 1

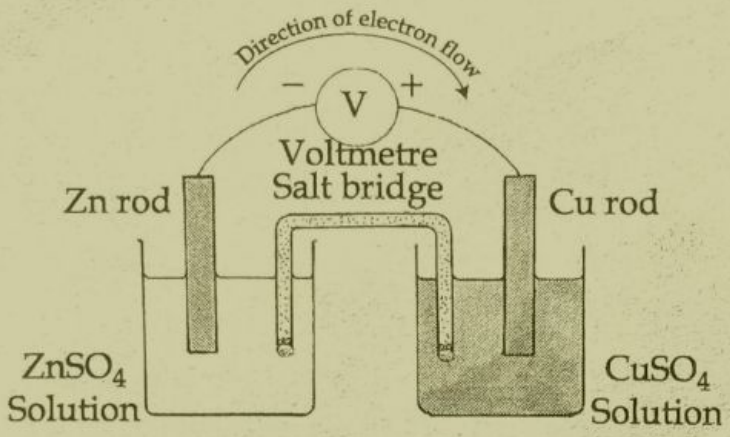
(c) Which block does it belong to ? 1

(d) Find the total number of electrons in all the p subshells of this element. 1

(e) Write down the subshell electronic configuration of X^{3+} ion. 1

Score

24. The diagram of a galvanic cell is given.



[Hint : Order of reactivity Mg > Zn > Fe > Cu > Ag]

(a) What is the energy change taking place in a galvanic cell ? 1

(b) At which electrode does oxidation take place ? 1

(c) Which metal does act as the cathode ? 1

(d) If Silver and Copper are used as electrodes to construct the cell, which metal does act as the anode ? 1

(e) Write down the chemical equation of the reaction taking place at Copper electrode in this case. 1

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