

# SSLC EXAMINATION, MARCH - 2021

## CHEMISTRY

(English)

Total Score : 40

Time : 1½ Hours

**Instructions :**

- 20 minutes is given as cool-off time.
- Use cool-off time to read the questions and plan your answers.
- Attempt the questions according to the instructions.
- Keep in mind, the score and time while answering the questions.
- The maximum score for questions from 1 to 32 will be 40.

Score

Each question from 1 to 8 carries 1 score.

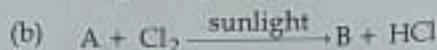
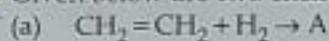
- |    |                                                                                                                                                                         |   |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 1. | What is the maximum number of electrons that can be accommodated in 'f' subshell ?<br>(2, 6, 10, 14)                                                                    | 1 |
| 2. | Identify the alkene among the given hydrocarbons.<br>(C <sub>2</sub> H <sub>6</sub> , C <sub>2</sub> H <sub>4</sub> , C <sub>2</sub> H <sub>2</sub> , CH <sub>4</sub> ) | 1 |
| 3. | Metals like gold, platinum are found in the native state in the earth's crust. Why ?                                                                                    | 1 |
| 4. | One gram atomic mass (1 GAM) of any element contains _____ atoms.                                                                                                       | 1 |
| 5. | Select the monomer of natural rubber.<br>[Vinyl Chloride, Ethene, Isoprene, Tetrafluoro ethene]                                                                         | 1 |
| 6. | Which is the drying agent used to remove moisture present in ammonia gas ?                                                                                              | 1 |
| 7. | Which is the electrolyte used to electroplate Silver on an iron bangle ?                                                                                                | 1 |
| 8. | What is the energy change that takes place in galvanic cell ?                                                                                                           | 1 |

Each question from 9 to 16 carries 2 scores.

9. (a) When molten Sodium Chloride is electrolysed, which is the gas liberated at the anode? (1)
- (b) Write the chemical equation of the reaction taking place at the cathode. (1)

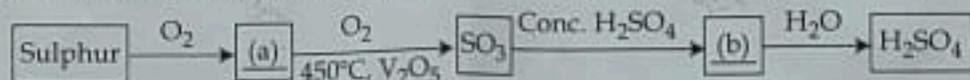
10. (a) From the given subshell electronic configuration, write the correct electronic configuration of Chromium ( ${}_{24}\text{Cr}$ ). (1)
- (i)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^2$
- (ii)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$
- (b) What is the reason of this selection? (1)

11. Given below are two chemical equations. (2)



Identify the compounds A and B.

12. The flow chart of the industrial preparation of sulphuric acid is given. Complete it. (2)

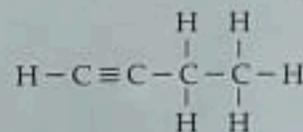


13. Some metals are given in the box. (1)

Fe Mg Cu Pb Zn

- (a) Which metal among these react vigorously with dilute HCl? (1)
- (b) Which gas is liberated by this reaction? (1)

14. The structure of an alkyne is given. (1)



- (a) What is the molecular formula of this compound? (1)
- (b) Write the IUPAC name. (1)

15. Two methods are used to convert concentrated ore into its oxide. (2)

- (a) Calcination (b) Roasting

What is the difference between these?

16.  $\text{CH}_4$ ,  $\text{C}_2\text{H}_6$ ,  $\text{C}_3\text{H}_8$  and  $\text{C}_4\text{H}_{10}$  are the members of a homologous series. (1)

- (a) What is the molecular formula of the 6<sup>th</sup> member of this series? (1)
- (b) Write the general formula of this homologous series. (1)

Each question from 17 to 24 carries 3 scores.

17. The chemical formulae of two different chlorides of iron (Fe) are given below.

(i) Ferrous Chloride -  $\text{FeCl}_2$

(ii) Ferric Chloride -  $\text{FeCl}_3$

[Hint : Oxidation State of chlorine atom (Cl) = -1

Atomic Number of iron (Fe) = 26]

(a) In which compounds iron (Fe) shows +2 oxidation state ? 1

(b) Write the Subshell electronic configuration of  $\text{Fe}^{3+}$ . 1

(c) Why does iron show different oxidation states ? 1

18. Some chemical reactions taking place in blast furnace are given.

(i)  $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

(ii)  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

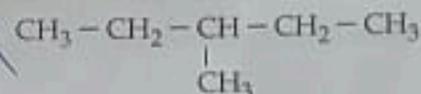
(iii)  $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$

(a) What is the chemical formula of haematite ? 1

(b) Which compound reduces haematite ? 1

(c) Identify the flux used here. 1

19. The structural formula of a hydrocarbon is given.



(a) How many carbon atoms are there in the main chain ? 1

(b) What is the position number of the branch ? 1

(c) Write the IUPAC name of this compound. 1

20. Some metals and their refining methods are given. Find the appropriate pair. 3

| Metal  | Refining Method       |
|--------|-----------------------|
| Tin    | Distillation          |
| Copper | Liquation             |
| Zinc   | Electrolytic Refining |

21. Outermost Subshell electronic configuration of two elements X and Y are given.

$$X = 3s^2$$

$$Y = 3s^2 3p^5$$

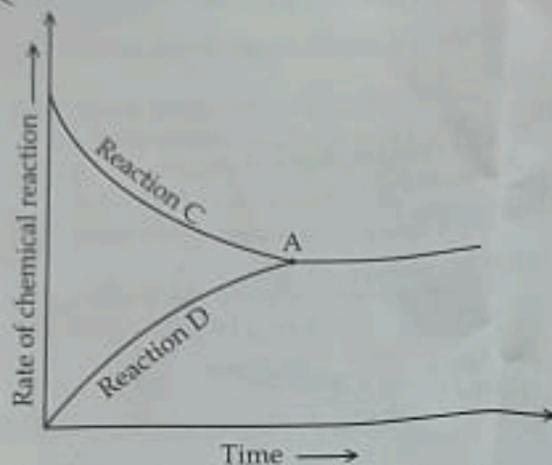
(Symbols are not real)

(a) What is the valency of the element X ? 1

(b) Which element shows metallic character ? 1

(c) Write the chemical formula of the compound formed by the combination of X and Y. 1

22. The graph for the reversible reaction,  $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g) + \text{Heat}$  is given below.

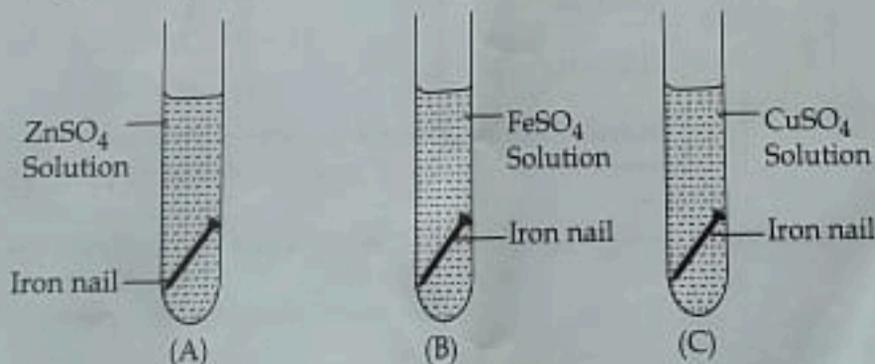


- (a) Identify and write the chemical equation associated with 'Reaction C' and 'Reaction D'. 2
- (b) What is the peculiarity of the point A? 1

23. The  $CO_2$  gas kept at STP has volume 112 L.  
[Hint: Molecular mass - 44]

- (a) Find the number of moles of  $CO_2$ . 1
- (b) Calculate the mass of 112 L  $CO_2$ . 1
- (c) How many molecules of  $CO_2$  are present in it? 1

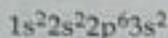
24. Analyse the figure and answer the following questions.



- (a) In which test tube the iron nail undergoes a colour change? 1
- (b) Write the name of the reaction taking place here. 1
- (c) Write the chemical equation of this reaction. 1

Each question from 25 to 32 carries 4 scores.

25. The Subshell electronic configuration of an element is given.



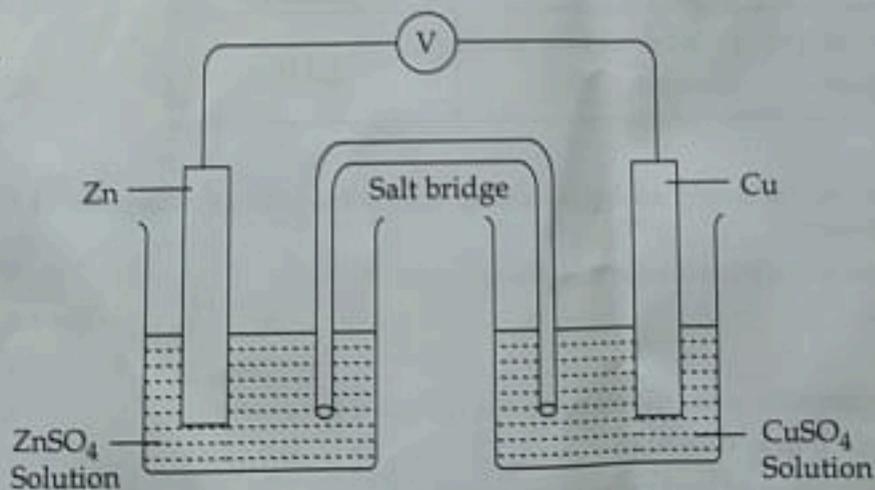
- (a) Write the atomic number of this element. 1
- (b) To which block this element belongs? 1
- (c) Identify the period number and group number of this element. 2

26. The structural formulae of two organic compounds are given.



- (a) Write the IUPAC name of the first compound. 1
- (b) These two organic compounds are isomers. Why? 1
- (c) Which type of isomerism is exhibited by them? 1
- (d) Write the structural formula of the position isomer of the second compound. 1

27. The figure of a galvanic cell is given.



[Hint : Zinc is more reactive than Copper]

- (a) Identify anode and cathode. 2
- (b) What will be the direction of flow of electrons? 1
- (c) Write the chemical equation of the reaction taking place at anode. 1

28. The chemical equation of the industrial preparation of ammonia is given below.



How does the following factors influence the rate of forward reaction?

- (a) Ammonia is removed from the system. 1
- (b) Temperature is increased. 1
- (c) Pressure is increased. 1
- (d) More nitrogen is added. 1

29. Identify the suitable concentration method from the box and then complete the table. 4

Leaching, Froth floatation,  
Magnetic Separation, Levigation

| Properties of ores                            | Properties of the impurities present in the ore | The method of Concentration |
|-----------------------------------------------|-------------------------------------------------|-----------------------------|
| High density                                  | Low density                                     | _____ (a) _____             |
| Magnetic in Nature                            | Non-magnetic in nature                          | _____ (b) _____             |
| Lighter Sulphide ores                         | High density                                    | _____ (c) _____             |
| Aluminium ores that get dissolved in solution | Insoluble in the same solution                  | _____ (d) _____             |

30. (a) What happens to the size of air bubble rising from the bottom of an aquarium? What is the reason? 2

(b) Which gas law is associated with this phenomenon? 1

(c) State this law. 1

31. From the given statements, write the statements applicable for gases. 4

(i) Energy of molecules is very high.

~~(ii)~~ Attractive force between molecules is very high.

(iii) Distance between molecules is very large.

~~(iv)~~ Freedom of movement of molecules is very less.

(v) As the collision of molecules are perfectly elastic in nature, there is no loss of energy.

(vi) When compared to total volume, the real volume of molecules is very less.

32. Find out the appropriate reactions and match the Columns A, B and C suitably.

| Reactants (A)                             | Products (B)                                      | Name of Reaction (C)  |
|-------------------------------------------|---------------------------------------------------|-----------------------|
| $\text{CH}_3 - \text{CH}_3 + \text{Cl}_2$ | $\text{CO}_2 + \text{H}_2\text{O}$                | Thermal cracking      |
| $\text{C}_2\text{H}_6 + \text{O}_2$       | $[\text{CH}_2 - \text{CH}_2]_n$                   | Substitution reaction |
| $n\text{CH}_2 = \text{CH}_2$              | $\text{CH}_2 = \text{CH}_2 + \text{CH}_4$         | Combustion            |
| $\text{CH}_3 - \text{CH}_2 - \text{CH}_3$ | $\text{CH}_3 - \text{CH}_2\text{Cl} + \text{HCl}$ | Polymerisation        |

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