

DIET KANNUR - KANNUR JILLA PANCHAYATH
SSLC MUKULAM EXAM -FEB 2021 SET A
CHEMISTRY

Time:1½ hours

Total score:40 Marks

Instructions

- 20 minutes is the cool off time. You may use this time to read, select and plan your answers.
- Answer the questions only after reading the instructions and questions thoroughly.
- Consider the score and time while answering the questions.
- **The maximum marks for questions 1 to 32 is 40.**

Each question from 1 to 8 carries 1 score each

1. Which subshell among the following has the lowest energy?
(2s, 2p, 3d, 1s)
2. The lighter sulphide ores are concentrated by the method _____
3. Select the oxidation reaction from the following.
a) $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$ b) $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$
4. The number 6.022×10^{23} is known as _____
5. Which of the given compounds undergo addition reaction?
($\text{CH}_3\text{-CH}_3$, CH_4 , $\text{CH}_2=\text{CH-CH}_3$, $\text{CH}_3\text{-CH}_2\text{-CH}_3$)
6. The process of industrial preparation of ammonia is known as _____ .
7. The compounds containing the functional group $-\text{O}-\text{R}$ are commonly known as _____ .
8. What happens when a catalyst is added to a system at equilibrium?
 - a. Rate of forward reaction increases.
 - b. Rate of backward reaction increases.
 - c. Rate of both the reactions increases.
 - d. No change takes place.

Each question from 9 to 16 carries 2 score each

9. a) Write the stable electronic configuration of ${}_{24}\text{Cr}$.
b) Explain the reason for this configuration.
10. $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$
 - a) Write the molecular formula of this compound.
 - b) Write the structural formula of the chain isomer of this compound.
11. a) Which substance is liberated at the Anode when molten NaCl is electrolysed ??
b) Give the balanced chemical equation of the reaction taking place at the cathode.

12. Complete the table

Metal	Method of refining
Copper	Electolysis
Zinca.....
Tinb.....

13. a) What happens to the size of a gas bubble rising from the bottom of a water body?

b) Which is the gas law associated with this?

14. C_2H_4 , A, C_4H_8 are three consecutive members of a homologous series.

a) Write down the molecular formula of the compound A.

b) To which category does this homologous series belong?

(Alkanes, Alkenes, Alkynes)

15. Alloy steels are made by adding other metals to steel.

a) Which alloy steel is used for making permanent magnets?

b) Why nichrome is used for making heating coils?

16. a) Which is the main component of LPG ?

b) What are the products obtained by the combustion of LPG?

Each question from 17 to 24 carries 3 score each

17. The subshell electronic configuration of an element is $1s^2 2s^2 2p^6 3s^2 3p^6 3d^2 4s^2$.

a) What is the atomic number of this element?

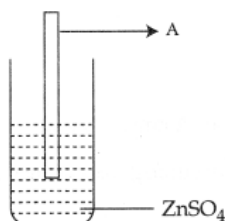
b) Find the block to which this element belongs.

c) Write any one property of the elements in this block.

18. a) How many moles of CO_2 are there in 440g CO_2 ? (Atomic mass : C=12, O=16)

b) Find the number of molecules in the same number of moles of NH_3 .

19. The following figure represents a displacement reaction. The metal A may be Zn, Mg, Fe or Cu.



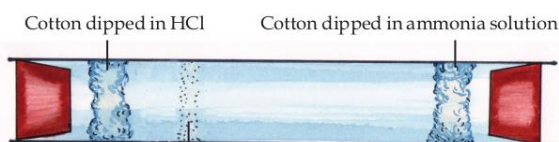
a) Identify the metal A.

(Hint: Order of reactivity $Mg > Zn > Fe > Cu$)

b) Which metal undergoes Oxidation?

c) Write the chemical equation of reduction reaction.

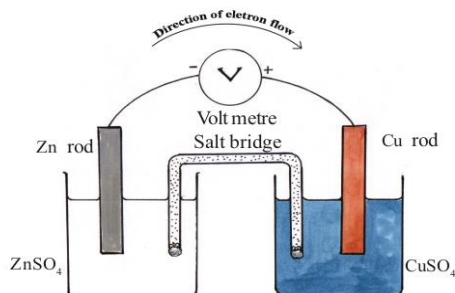
20. Iron is manufactured using the Blast furnace.
- Name the ore used for the manufacture of Iron.
 - Which substance is used as the reducing agent in the blast furnace?
 - Which substance is added to the ore of iron as flux to remove impurities??
21. Analyse the following figure and the observations given below.



Observations

- (A) A white powder has been stuck on the inner side of the tube.
- (B) When the glass tube is heated, the white powder disappears.
- Identify the white powder formed.
 - Write down the chemical equation of the formation of this white powder.
 - On heating the white powder disappears. Why?

22.



- Write the energy change taking place in a galvanic cell.
 - Identify the anode and cathode in this cell.
 - Write the chemical equation of the reaction taking place at the cathode.
23. Two systems at equilibrium are given below.
- $$\text{N}_2 (\text{g}) + 3\text{H}_2 (\text{g}) \rightleftharpoons 2\text{NH}_3 (\text{g}) + \text{heat}$$
- $$2\text{HI}(\text{g}) + \text{heat} \rightleftharpoons \text{H}_2(\text{g}) + \text{I}_2(\text{g})$$
- Which of the above reaction is not affected by pressure?
 - Suggest any two methods to get more ammonia in system 1?
24. The subshell electronic configurations of some elements are given below. (Symbols are not real) Analyse them and answer the following questions.
- A - $1s^2 2s^2 2p^6$**
- B - $1s^2 2s^2 2p^6 3s^2 3p^4$**
- C - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^2$**
- D - $1s^2 2s^2 2p^6 3s^2$**
- Which among them is a noble gas ?
 - Which of them produce coloured compounds?
 - Which among them belong to same period?

Each question from 25 to 32 carries 4 score each

25. Arrange the columns B and C in accordance with column A.

A Reactants	B Products	C Name of the reaction
$\text{CH}_2=\text{CH}_2 + \text{Cl}_2$	$\text{CO}_2 + 2\text{H}_2\text{O}$	Polymerisation
$\text{CH}_4 + 2\text{O}_2$	$-\text{[CH}_2\text{-CH}_2\text{]}_n$	Addition reaction
$\text{CH}_4 + \text{Cl}_2$	$\begin{array}{c} \text{Cl} \quad \text{Cl} \\ \quad \\ \text{CH}_2\text{-CH}_2 \end{array}$	combustion
$n\text{CH}_2=\text{CH}_2$	$\text{CH}_3\text{Cl} + \text{HCl}$	Substitution reaction

26. Analyse the table and answer the questions. (Symbols are not real)

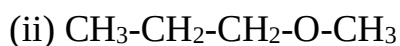
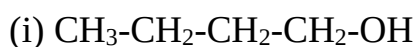
Element	Period number	Outer subshell and electrons in them
X	2	p^5
Y	3	s^2

- Write the complete electronic configuration of the element X.
- In which block does the element Y belong?
- Write the formula of the compound formed by the combination of X & Y.

28. CuSO_4 solution is taken in 3 beakers. A Cu rod is placed in the first beaker, an Fe rod in the second and an Ag rod in the third one.

- Which metal is responsible for the colour of solutions taken in the beakers?
- In which beaker does the colour change occur?
- Write down the equation of the reaction that led to the colour change.
- If galvanic cells are constructed using Cu, Fe and Ag electrodes, which electrode will always act as anode?

29. Structure of two organic compounds are given. (Molecular formula - $\text{C}_4\text{H}_{10}\text{O}$)



- Write the name of the functional group in the first compound.
- Which type of isomerism is exhibited by these compounds?
- Write the structure of the position isomer of the compound (i).
- Write the IUPAC name of that position isomer.

30. The equation representing an important stage in the industrial preparation of Sulphuric acid.



- Name the process of industrial preparation of Sulphuric acid ?
- Which is the catalyst used in this process?

c) How do the following changes influence the forward reaction?

i) More oxygen (O₂) is added.

ii) Pressure is decreased.

31. CH₃-CH₂-CH₂-CH-CH₂-CH₃



a) Write the molecular formula of this hydrocarbon.

b) How many carbon atoms are there in the main chain of this hydrocarbon?

c) Name the branch present in this compound.

d) Write down the IUPAC name of this hydrocarbon

32. The relation showing the volume and temperature of fixed mass of gas at constant pressure is tabulated below.

Volume V(L)	Temperature T(K)	V / T
600	300	---.(x).-
800(y)....	2
.....(z).....	450	2

a) Find the values of x ,yand z

b) Which gas law is associated with this table?