E 1006 Ch

SAMAGRA SHIKSHA KERALA

FIRST TERMINALEVALUATION 2019-20

CHEMISTRY

STD : X

Score :40

Time : 1 ½ Hours

Instructions

- First 15 minutes is given as cool-off time.This time is to be spent for reading the question paper.
- Answer the questions according to the instructions.
- Answer the questions after considering the score and time.

Answer any 4 questions from 1 to 5. Each carries 1 score. **(4×1=4)**

1. Which subshell among the following has the highest energy? (1)

   (2p, 4s, 3d, 3p)

2. Find the number of gram molecular mass(GMM) present in 56g Nitrogen. (1)

   [Hint: Molecular mass of nitrogen is 28]

3. Which of the given metal reacts vigorously with water. (1)

   (Cu, Fe, Na, Au)

4. What is the oxidation state of Cu in Cu_2O.

   [-2, + 2, + 1, -1]

   [Hint: Oxidation state of Oxygen is -2] (1)

5. Analyse the situations given below and write the one which is related to Boyle's law. (1)

   a) If an inflated balloon is kept in sunlight, it will burst after some time.

   b) As the balloon is being inflated, its volume increases.

   c) The size of air bubbles rising from the bottom of a water body gradually increases.

Answer any 4 questions from 6 to 10. Each carries 2 scores. **(4×2=8)**

6. The subshell electronic configuration of an element is given in two ways.

   (i) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^4\ 4s^2$

   (ii) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5\ 4s^1$

   Which among these is the correct electronic configuration? Give reason. (2)

7. a) Which among the following metals does not react with dilute HCl?
(Na, Cu, Mg, Fe) (1)

b) Name the gas formed when metals react with dilute HCl? (1)

8. Analyse the statements given below and correct the wrong statements.
a) As distance from nucleus increases, energy of shells decreases.
b) Electron filling in shells occurs in the increasing order of energy.
c) As distance increases, attraction between the nucleus and electron decreases.
d) s and p subshells are common in all shells. (2)

9. Atomic mass of some elements are given [Mg = 24, O = 16]
a) How many atoms are there in 120g Mg? (1)
b) Find the mass of $4 \times 6.022 \times 10^{23}$ oxygen atoms. (1)

10. The gas in a cylinder A of volume 2L is completely transferred into cylinder B of volume 4L without changing temperature.
a) What is the new volume of the gas? (1)
b) Gas in which cylinder experiences more pressure? (1)

Answer any 4 questions from 11 to 15. Each carries 3 scores. **(4×3=12)**

11. The subshell electronic configuration of an element X is $[Ar]\ 3d^8\ 4s^2$.
a) How many shells are there in an atom of this element? (1)
b) The last electron filling occurs in which subshell? (1)
c) Find the group number of this element. (1)

12. The molecular mass of SO_2 is 64.
a) Find the mass of 1GMM SO_2. (1)
b) Find the number of molecules in 1 GMM SO_2. (1)
c) Find out the number of moles of molecules in 320g of SO_2 (1)

13. A displacement reaction is given below.
$X + ZnSO_4 \longrightarrow XSO_4 + Zn$ (Hint: X is a metal)
a) Analyse the reactivity order given below and identify the possible metal X. (1)
[Hint: Mg > Zn > Fe > Cu]
b) Write the chemical equation which shows the change occuring to Zn^{2+} ions in this reaction. (1)
c) Whether the change occuring in Zn^{2+} ion is oxidation or reduction? Why? (1)

14. SO_2 and CO_2 are two gases kept at STP.
a) What is the volume of 1 mole gas at STP? (1)
b) If the volume of CO_2 and SO_2 are 112L each,
(i) Find out the number of moles of CO_2. (1)
(ii) How many molecules are present in SO_2? (1)

15. The data of an experiment conducted on a fixed mass of gas at constant pressure are given.

Volume (V) L	Temperature (T) K
600	300
800	(a)
(b)	450

a) Find the values of (a) and (b) (2)
b) Which gas law is illustrated here? (1)

Answer any 4 questions from 16 to 20. Each carries 4 scores. **(4×4=16)**

16. The outermost subshell electronic configuration of an element Y is $3s^2\ 3p^1$
(Symbol is not real)
a) Write the complete subshell electronic configuration of this element. (1)
b) To which period and block does this element belong? (2)
c) Write the outermost subshell electronic configuration of noble gas belonging to same period. (1)

17. The volume of 2 mol hydrogen gas at 1 atm pressure and 273 K is 44.8 L.
a) Name the scientist who established the relationship between the volume and pressure of a gas through experiment. (1)
b) What will be the new pressure if the volume of hydrogen gas is changed to 22.4 L. (2)
[Hint: Temperature is constant]
c) Suggest a method to increase the volume of this gas without changing the pressure and mass. (1)

18. Subshell electronic configuration of some elements are given.
(Symbols are not real)
A - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$
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 - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2$

a) Which element among these shows -2 oxidation state? (1)
b) Which element has the highest metallic character? (1)
c) Which element has the highest ionisation energy? (1)
d) Write the chemical formula of the compound formed by the elements A and D. (1)

19. The molecular arrangement in solid, liquid and gaseous states are different.

a) On the basis of this, write a short note on gaseous state highlighting the energy of molecules, distance between molecules, attractive force between molecules and freedom of movement of molecules. (2)

b) Some characteristics of constant moving gas molecules are responsible for maintaining the pressure of a gas. Write any two relevant characteristics. (2)

20. Atomic number of Manganese is 25.

a) Write the subshell electronic configuration of Manganese. (1)

b) Write the subshell electronic configuration of the positive ion in MnO_2. (The oxidation state of oxygen is -2) (2)

c) Give reason for the variable oxidation states of d block elements? (1)