A

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FIRST TERM EVALUATION 2022

CHEMISTRY

Class: X

Time: 1½hour
Score : 40

Instructions

- The first 15 minutes is cool off time. You may use the time to read and plan your answers.
- Answer the questions only after reading the instructions and questions thoroughly.
- Score and time are to be considered while answering.

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

1. Which of the following metals reacts with cold water?   (1)

    (Sodium,   Magnesium,   Copper,   Iron)

2. The volume of one mole ammonia kept at STP is .... litres.   (1)

3. Which subshell is common to all shells?   (1)

    (s, p, d, f)

4. The number of molecules in one mole of oxygen is ....   (1)

5. How many subshells are there in 'L' shell?   (1)

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

6.a) Which of the following metals reacts vigorously with dilute hydrochloric acid?   (1)

    (Gold,   Magnesium,   Lead,   Iron)

  b) Which is the gas produced in this reaction?   (1)

7. Mn is an element which shows variable oxidation states.

    a) Calculate the oxidation state of Mn in MnO_2

        (Hint : The oxidation state of oxygen is - 2)   (1)

    b) Write any one characteristic property of elements of the block in which manganese
        is included.   (1)

8. The molecular mass of CO_2 is 44

    a) What is the mass of 1 GMM of carbondioxide?   (1)

    b) Find the number of GMM in 220 g of CO_2 (1)

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9. Select from given statements those suitable for gases. (2)

   a) The molecules are in a state of rapid random motion in all direction.

   b) The force of attraction between the molecules in very high.

   c) As the collisions of molecules are perfectly elastic in nature, there is no loss of energy.

   d) The distance between the molecules is very less.

10. The atomic number of an element in 11.

   a) Write the sub shell electronic configuration of this element. (1)

   b) Which is the common oxidation state shown by this element? (1)

Answer any four questions from 11 to 15. Each question carries 3 scores. (4 x 3 = 12)

11. The data obtained from an experiment which proves the relation between volume and temperature of a fixed mass of gas is given in the table. (Pressure is kept constant.)

Volume (V) (Litres)	Temperature (T) (Kelvin scale)
500	100
1000	....(x)...
...(y)...	300

   a) Find the values of x and y. (1)

   b) What is the relation between volume and temperature of a gas? (1)

   c) Which gas law is related to this? (1)

12. The atomic number of Iron (Fe) is 26.

   a) Write the sub shell electronic configuration of Iron. (1)

   b) Write the period number and group number of Iron. (1)

   c) Write the sub shell electronic configuration of Fe^{2+} ion. (1)

13. An equation showing a displacement reaction is given below.

$$X^{0} + Zn^{+2}SO_4^{-2} \rightarrow X^{+2}SO_4^{-2} + Zn^{0}$$

(Hint : X is a metal)

   a) Which metal gets oxidised in this reaction? (1)

   b) Analyse the reactivity series and identify the metal 'X'. (1)

      Hint : (Mg > Zn > Fe > Cu)

   c) Write the chemical equation representing the change taken place to Zn^{2+} ion. (1)

14. The data obtained for different gases kept at same temperature and pressure is given below.

Gas	Volume (L)	Number of molecules
Nitrogen	20	X
Oxygen	10	.....(a)....
Ammonia	....(b)...	2X

   i)   Complete the table. (2)

   ii) Which gas law is applied here? (1)

15. The atomic number of chromium is 24.

   a) Write the subshell electronic configuration of chromium. Give reason for the peculiar electronic configuration of Cr. (2)

   b) To which block does chromium belong? (1)

Answer any four questions from 16 to 20. Each question carries 4 scores.   (4 x 4 = 16)

16. The subshell electronic configurations of some elements are given. (Symbols are not real)

   P - [He] $2s^2 2p^5$

   Q - [Ne] $3s^2 3p^4$

   R - [Ar] $3d^7 4s^2$

   S - [Ar] $4s^1$

   a) Write the atomic number of the element 'Q'. (1)

   b) Which is the most electronegative element? (1)

   c) Which element has the higher metallic nature? (1)

   d) Write the chemical formula of the compound formed by the combination of Q and S. (1)

17. SO_2 and NH_3 are two gases kept at STP.

   a) Find the molecular mass of Sulphur dioxide (SO_2). (1)

       (Hint : Atomic mass S = 32, O = 16)

   b) What is the volume of 1 mole of SO_2 kept at STP? (1)

   c) Calculate the number of moles in 112 L of SO_2 . (1)

   d) Calculate the number of molecules in 170g of NH_3 . (1)

       (Hint : molecular mass NH_3 = 17)

18. Zinc rod is dipped in $CuSO_4$ solution. Observe the changes taking place after some time.

    a)   Which metal is more reactive, Zn or Cu?   (1)

    b)   Which metal is displaced during this reaction?   (1)

    c)   Is this a redox reaction? Give reason.   (2)

19. The outermost 3d subshell of a metal ion contains 3 electrons.

    a)   Write the complete subshell electronic configuration of this metal ion.   (1)

    b)   To which block does this metal belong?   (1)

    c)   The elements in this block show similarities in properties both in periods and groups. Why?   (1)

    d)   The element in this block show variable oxidation states. Why?   (1)

20. The two situations are given

    1)   If an inflated balloon is immersed in water, its size decreases

    2)   A balloon is being inflated

    a)   Which are the gas laws applicable in these situations?   (2)

    b)   Explain the reason for these changes.   (2)