THIRUVANANTHAPURAM EDUCATIONAL DISTRICT

CHEMISTRY

STD : X

TIME : 1 $^{1}/_{2}$ hours

Total Score : 40

(Answer any 4 from questions 1 to 5. Each question carries 1 score)

1. How many subshells are present in M shell of an element ?
2. Which subshell among the following has the highest energy?

   (2p,4s,3d,3p)
3. One gram atomic mass of any element contains.....atoms.
4. In which block does the inner transition elements belong?
5. Molar volume of CO_2 at STP is ..... litres.

(Answer any 4 from questions 6 to 10. Each question carries 2 score)

6. Choose the correct statements related to d-block elements.

   a) Shows variable oxidation states
   b) They are Non-metals
   c) They produce coloured compounds.
   d) They show high electronegativity.

7. Analyse the given table containing data of gases at constant temperature and pressure.

Gas	Volume(L)	Number of molecules
Hydrogen	5 L	x
Ammonia	10 L	.....A.....
Oxygen	.....B....	3x

a) Complete the table.
b) Name the law which explains the above relation.

8. The subshell electronic configuration of Chromium is ($_{24}$Cr) given.

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

a) Select the correct electronic configuration of chromium ?
b) Justify your answer.

9. Atomic mass of nitrogen is 14.

a) How many atoms are present in 2 GAM nitrogen.
b) Find the mass of $4 \times 6.022 \times 10^{23}$ nitrogen atoms.

10. The molecular mass of CO_2 is 44.

a) Find the mass of 1GMM CO_2 .
b) How many moles of molecules are there in 220 g of CO_2?

(Answer any 4 from questions 11 to 15. Each question carries 3 score)

11. The atomic number of an element is 19.

a) Write the subshell electronic configuration of the element.
b) Find out the period number and group number of the element.
c) To which block does the element belong?

12. The chemical formulae of two different oxides of Iron ($_{26}$Fe) are given below.
(Oxidation state of Oxygen atom = - 2)

(i). Ferrous Oxide – FeO
(ii). Ferric Oxide – Fe_2O_3

a) In which compound Iron (Fe) shows +2 oxidation state ?
b) Write the subshell electronic configuration of Fe^{3+}.
c) Why does iron show variable oxidation state.

13. Complete the table.

Element	Mass in grams	Number of GAM	Number of atoms
Carbon	24g	**.....A.....**	$2 \times 6.022 \times 10^{23}$
Sulphur	128 g	4	**.....B.....**
Helium	**.....C.....**	5	$5 \times 6.022 \times 10^{23}$

(Atomic mass C=12, S= 32, He = 4)

14. Calculate the following.

(Atomic mass N=14, Na = 23, O = 16, H = 1)

(a) Molecular mass of NaOH.

(b) Number of moles present in 2 GMM of NH_3

(c) Number of molecules present in 36g of H_2O

15. The figures given below represent the air bubbles rising from the bottom of a test tube containing water.

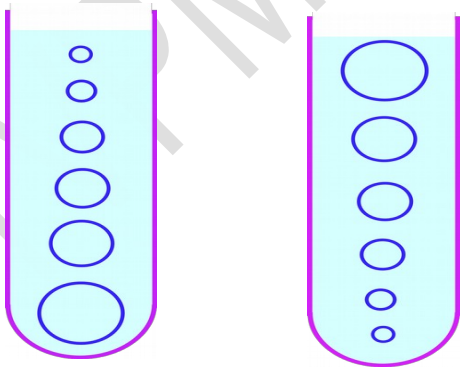

Figure A **Figure B**

a) Find out the correct figure ?

b) Justify your answer by using suitable law.

c) Write any one instance from daily life related to this law.

(Answer any 4 from questions 16 to 20. Each question carries 4 score)

16. Subshell electronic configuration of a few elements are given. (Symbols are not real)

A - [Ar] $4s^2$
B - [Ar] $3d^5\ 4s^1$
C - [Ne] $3s^2$
D - [Ne] $3s^2\ 3p^5$

(a) Write the complete subshell electronic configuration of element B.
(b) Which of the above elements belong to the same group ?
(c) Which among them has the highest electronegativity ?
(d) Write the formula of the compound formed by the elements C and D.

17. a) The volume of a fixed mass of gas at 200K is 10L. What will be the volume of the gas, if the temperature is doubled without changing the pressure.
b) Name the gas law related to this ?
c) Write the mathematical expression of the above law.
d) The tyres of motor vehicles are not completely filled during summer. Explain.

18. Complete the table suitably.

Element/ Compound	**Molecular Mass**	**Mass in gram**	**Moles**	**Number of molecules**	**Volume at STP**
N_2	28	**..(a)..**	5	5 X N_A	112 L
H_2	2	20g	10	**..(b)..**	224 L
CO_2	44	132g	4	4 X N_A	**..(c)..**
H_2S	34	102g	**..(d)..**	3 X N_A	67.2 L

19. The subshell electronic configuration of some elements are given.
(Symbols are not real)

A - $1s^2\ 2s^2\ 2p^3$
B - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$
C - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5\ 4s^2$
D - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

(a) Find the group number of the element A.
(b) Write the element belongs to halogen family.
(c) Write one of the characteristics of the element C.
(d) Which element shows zero valency.

20. Match the following suitably.

A	B
s - block	Compounds of these elements are used for giving colour to glasses and in oil paintings.
p - block	The oxides and hydroxides of these elements are basic in nature.
d - block	These elements are used as fuels in nuclear reactors.
f - block	These elements are in the solid, liquid and gaseous states at room temperature.