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## Rahula College - Matara



First term test, Grade 12    Time    1.30 hrs,

### Chemistry II

- Answer all Questions,

01). First ionization of Some elements are given below.

element	A	B	C	D	E	F	G
Atomic number	Z - 2	Z - 1	Z	Z + 1	Z + 2	Z + 3	Z + 4
I, KJ mol <sup>-1</sup>	1680	2080	494	736	577	786	1060

i). Identify the groups of A,B,C,D,E,F,G,.

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ii). A,B, and (Z-3) are gases under room temperature. Identify

A,B,C,D,E,F, exactly in the periodic table..

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iii). Draw the variation of covalent radii of the above element in the given graph,



iv). C,D,E,F,G, Arrange the increasing order of electro negativity of above elements.

v). Plot the consecutive ionization energies with ionization number of element A.

vi). Write the electronic configuration of 'C'

vii). What is the chemical formula between 'C' and 'A' Explain its' bonding type.

02) Two consecutive series of H – spectrum is given below.



i). Draw the electron transitions of the above series in the given energy levels, using arrows and correct symbols.

n = 5 \_\_\_\_\_  
n = 4 \_\_\_\_\_  
n = 3 \_\_\_\_\_  
n = 2 \_\_\_\_\_

n = 1 \_\_\_\_\_

ii). Name the given two series of the above spectrum?

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iii). What are the transitions for the above two series in the electro – magnetic spectrum,

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iv). Mention the direction to where the frequency is increased,

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v). What is the relationship among E – energy, frequency and h – plank constant of a photon?

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vi). Wave length of a yellow light obtained from a sodium lamp is 589 nm. Calculate the frequency and energy of a photon.

Plank constant =  $6.624 \times 10^{-34} \text{Js}$

Velocity of the ray =  $2.998 \times 10^8 \text{ms}^{-1}$

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03) i). What are the possible resonance structures for  $N_2O$  molecule.

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ii). Select the most stable and unstable structures of the above .

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iii). Write the hybridizations of certain elements in the given circles.

04) i). Fill in the table.

molecule	Electron pairs of valence shell in the mid – atom	No. of bonds around the mid atom.	No. of lone pairs around the mid - atom	Shape/ geometry.
SF <sub>4</sub>				
PCl <sub>6</sub>				
ICl <sub>3</sub>				
I <sub>3</sub>				
Xe F <sub>4</sub>				
HOCl				
NH <sub>4</sub>				

ii). Draw the electron pair arrangement around the mid – atoms of SF<sub>4</sub> , I<sub>3</sub> , PCl<sub>6</sub>, show a bond by a line and a lone pair by structure.

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05) Calculate the followings.

i). What is number of total atoms in 0.2 mol of C<sub>6</sub> H<sub>12</sub> O<sub>6</sub> molecule?

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ii). What is the number of moles which consist of  $3.011 \times 10^{24}$  amount of Na – atoms?

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iii) What is the number of moles in 0.49 g of  $H_2SO_4$  ?

(H = 1, S = 32, O = 16)

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iv). What is the mass of 4.5 mol of  $N_2O_3$  ? (N = 14)

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v). What is the mass of a  $Cl_2$  molecule? (Cl = 35.5)

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vi) What is the mass of a K – atom ? (K = 39)

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vii). Calculate the concentration of the solution when 2g of Na OH is dissolved in 250  $cm^3$  of water?

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viii 5). What is the required mass of  $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$  to prepare  $500 \text{ cm}^3$  of  $0.5 \text{ mol dm}^{-3}$   $\text{CaCl}_2$  solution (Ca = 40)

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ix). What is the volume of  $1.5 \text{ mol dm}^{-3}$   $\text{CuSO}_4$  solution that consist of 0.03 mol of  $\text{CuSO}_4$  ?

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x).  $200 \text{ cm}^3$  of  $3 \text{ mol dm}^{-3}$   $\text{KNO}_3$  solution and  $400 \text{ cm}^3$  of  $2 \text{ mol dm}^{-3}$   $\text{KNO}_3$  solution were mixed together. What is the concentration of new solution?

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