1.There exist 3 isotopes of oxygen that occur naturally with atomic mass 16,17 and 18 with abundance 99.1%, 0,89% and 0.01% respectively.

a)Given that oxygen occurs naturally as diatomic molecular, predict the number of peaks that will be observed on the screen of mass spectrometer.

b)Determination of the height of peaks

2.A. State the meaning of term mass number of an isotope

b. Define the term relative atomic mass of an element

c. A mass spectrometer measures the relative the relative abundance of ions with different values of m/z.

 Explain the meaning of symbols m and z

d. A sample of nicklle was analysed in a mass spectrometer three peaks were observedw ith the propertie shown in the following table

|  |  |  |  |
| --- | --- | --- | --- |
| Relative abudances% | 69 | 27 | 4 |
| m/z | 58 | 60 | 62 |

i.Give the symbol ,including the mass number and atomic number for the ions which was responsible for the peak with m/z=58

ii. Caluculate the atomic mass of this sample of a nickel.

3.a) The first seven ionization energies of an element W are shown below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1st I.E | 2nd I.E | 3rd I.E | 4th I.E | 5th I.E | 6th I.E | 7th I.E |
| 785 | 1581 | 3231 | 4361 | 16001 | 20001 | 23602 |

i.Explain what is meant by the term first ionization energy

ii.What factors determine the magnitude of the first ionization energy?

iii.State the groups in the periodic table to which element W belongs. Give reasons for your answer.

b)Explain what meant by the electronegativity? What factors determine the magnitude of electronegativity of an element

c. Explain how the following factors affects the magnitude of electronegativity of an element

i. Nuclear charge

ii.Atomic radius

iii.The sreening effect of the inner electrons

4.X,Y and Z represent element of atomic number 9,19 and 34

a. Write electronic structures for X, Y and Z

b. Give the type of chemical bonding in:

i.Xand Y

ii.X and Z

iii. YandZ

C. Draw dot/cross diagram for the compound formed ,show only electrons in the outermost shell for each atom

d. Predict,giving reasons,the relative

i.Electrical conductance

ii. The solubility in water

of the compound formed between X and Z compared with that of formed between X and Z.