**Questions**

**Q1.**

The bonding in **gaseous** hydrogen halides is best described as

   **A**     mainly covalent with an increasing tendency towards ionic as you go down the  
               group.

   **B**     mainly covalent with an increasing tendency towards ionic as you go up the  
               group.

   **C**     mainly ionic with an increasing tendency towards covalent as you go down the  
               group.

   **D**     mainly ionic with an increasing tendency towards covalent as you go up the  
               group.

**(Total for question = 1 mark)**

**Q2.**

Which of the following statements is **true**?

   **A**     Calcium hydroxide is more soluble in water than magnesium hydroxide.

   **B**     Chlorine is more electronegative than fluorine.

   **C**     Iodine is a stronger oxidizing agent than bromine.

   **D**     The first ionization energy of barium is greater than that of strontium.

**(Total for question = 1 mark)**

**Q3.**Which of the following statements about electronegativity is true?

   **A**    Non-metals have lower electronegativity than metals.

   **B**    Electronegativity decreases across a period in the Periodic Table.

   **C**    Electronegativity decreases going down a group in the Periodic Table.

   **D**    The bonds between atoms with equal electronegativity are always weak.

**(Total for Question = 1 mark)**

**Q4.**A charged rod is held beside a stream of liquid coming from a burette. Which of the following liquids would NOT be significantly deflected?

   **A**    H2O

   **B**    CCl4

   **C**    C2H5OH

   **D**    C2H5Br

**(Total for Question = 1 mark)**

**Q5.**

Consider the following organic liquids:

**A**  ethanal

**B**  ethanol

**C**  tetrachloromethane

**D**  trichloromethane

(a) Each liquid is run from a burette. Which liquid would not be deflected significantly by a charged rod?

**(1)**

   **A**

   **B**

   **C**

   **D**

(b) Which liquid would react with phosphorus(V) chloride to give a gas which fumes in moist air?

**(1)**

   **A**

   **B**

   **C**

   **D**

(c) Which liquid would you expect to have the peak at the greatest mass/charge ratio in its mass spectrum?

**(1)**

   **A**

   **B**

   **C**

   **D**

(d) Which liquid has an infrared spectrum with a broad absorption due to hydrogen bonding?

**(1)**

   **A**

   **B**

   **C**

   **D**

**(Total for question = 4 marks)**

**Q6.**

An electric field can affect the direction of a stream of some liquids.  Which of these  
 liquids would be affected by an electric field?

   **A**     1-chloropropane

   **B**     Pentane

   **C**     Tetrachloromethane

   **D**     Cyclopentane

**(Total for question = 1 mark)**

**Q7.**

Which of these four molecules, PCl3, CO, CO2 and CCl4, are polar?

   **A**     All four

   **B**     PCl3 and CO

   **C**     CO and CCl4

   **D**     PCl3 and CO2

**(Total for question = 1 mark)**

**Q8.**

The electronegativities of four pairs of elements are given below. Which pair would form the compound with the greatest ionic character?

   **A**     0.7 and 4.0

   **B**     0.7 and 3.5

   **C**     1.0 and 4.0

   **D**     0.8 and 2.8

**(Total for question = 1 mark)**

**Q9.**In which series of compounds does the covalent character increase, going from left to right?

   **A**    NaCl, MgCl2, AlCl3, SiCl4

   **B**    SiO2, Al2O3, MgO, Na2O

   **C**    LiI, NaI, KI, RbI

   **D**    KI, KBr, KCl, KF

**(Total for Question = 1 mark)**

**Q10.**

Which of the following molecules is polar?

   **A**    CO2

   **B**    SO2

   **C**    SO3

   **D**    O2

**(Total for question = 1 mark)**

**Q11.**

Tetrachloromethane, CCl4, is a

   **A**   polar molecule with polar bonds.

   **B**   polar molecule with non-polar bonds.

   **C**   non-polar molecule with polar bonds.

   **D**   non-polar molecule with non-polar bonds.

**(Total for question = 1 mark)**

**Q12.**

Which of the following molecules is **non-polar**?

   **A**    CH3Cl

   **B**    CH2Cl2

   **C**    CHCl3

   **D**    CCl4

**(Total for Question = 1 mark)**

**Q13.**

Which of the following molecules is polar?

   **A**     Carbon dioxide, CO2

   **B**     Beryllium chloride, BeCl2

   **C**     Ammonia, NH3

   **D**     Boron trifluoride, BF3

**(Total for question = 1 mark)**

**Q14.**

Which of the following molecules contains polar bonds but is **not** a polar molecule?

   **A**     Chlorine, Cl2

   **B**     Hydrogen chloride, HCl

   **C**     Trichloromethane, CHCl3

   **D**     Tetrachloromethane, CCl4

**(Total for question = 1 mark)**

**Mark Scheme**

**Q1.**



**Q2.**



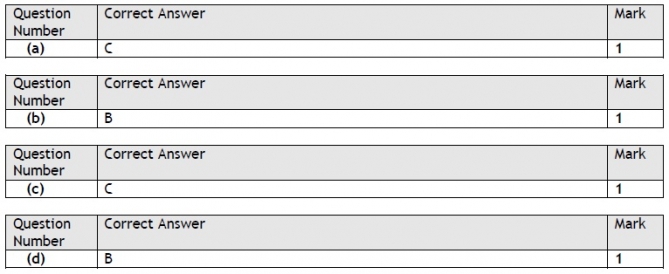
**Q3.**



**Q4.**



**Q5.**



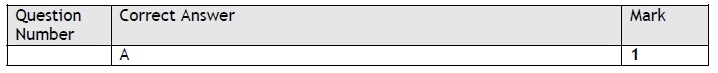
**Q6.**



**Q7.**



**Q8.**



**Q9.**



**Q10.**



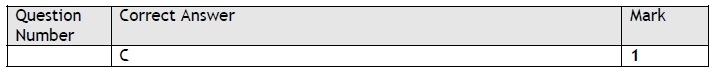
**Q11.**



**Q12.**



**Q13.**



**Q14.**

