Science English Test Semester 2 2020

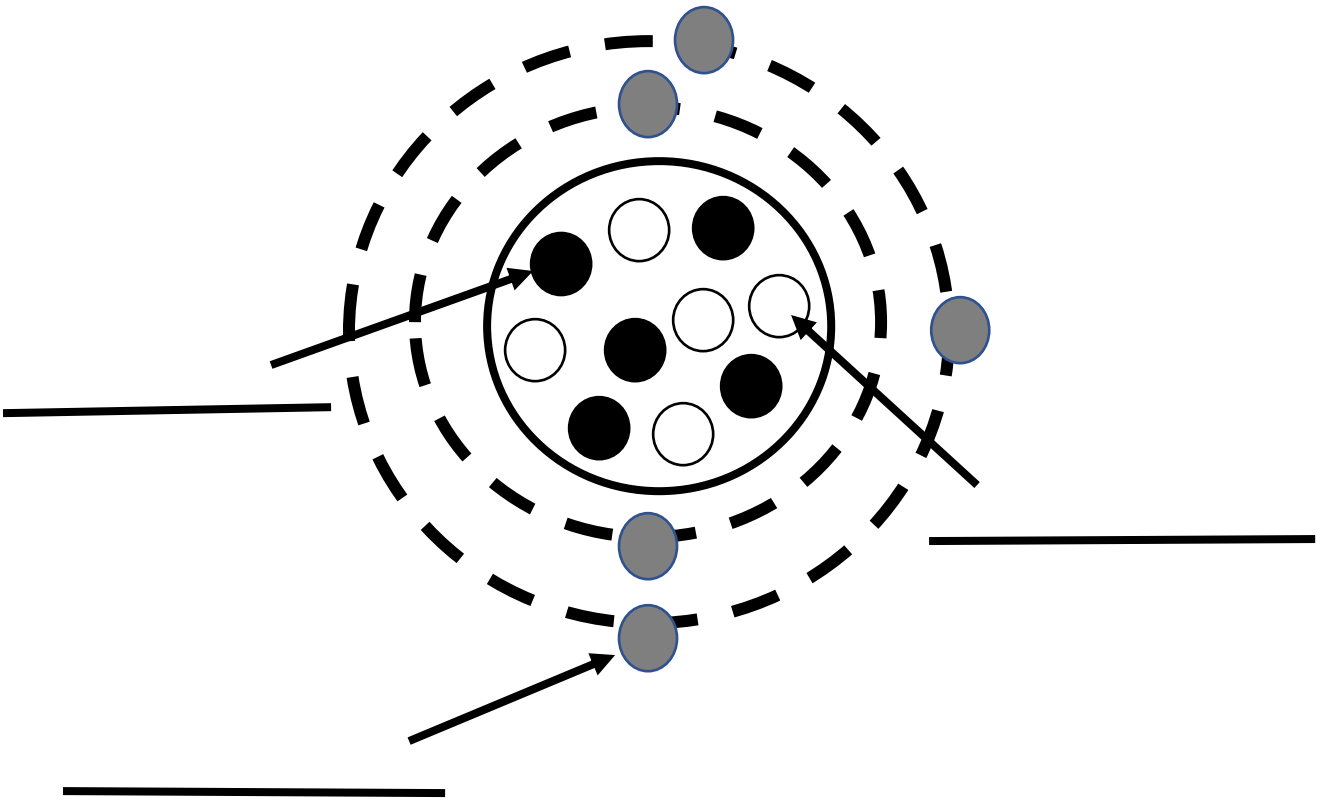
Chemistry [/50]

Atoms make up everything in our world, so it is important to understand them.

1. a) Please put the following list of words in order from **smallest to largest**. **[2 marks]**

Polymer Nucleus Material Atom Molecule

b) In the diagram below, please label the different part of the atom. Write the name AND **the charges** of the particles. **[3 marks]**

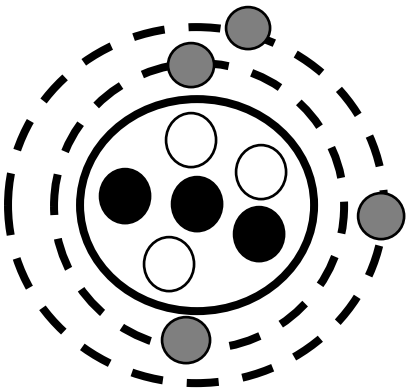


c) What is the atomic number **and** name of the atom in 1 b)? **[2 marks]**

d) How do you know what the atomic number of an atom is? **[1 mark]**

e) Atoms, like the one above, are mostly empty space, but they look solid. Why do atoms look solid? **[1 mark]**

2. a) Please look at the atom below. What is the name of this special type of atom? Why does this atom have this special name? **[2 marks]**



b) What is the overall charge of the atom in 2a)? Please put a circle around the correct answer. **[1mark]**

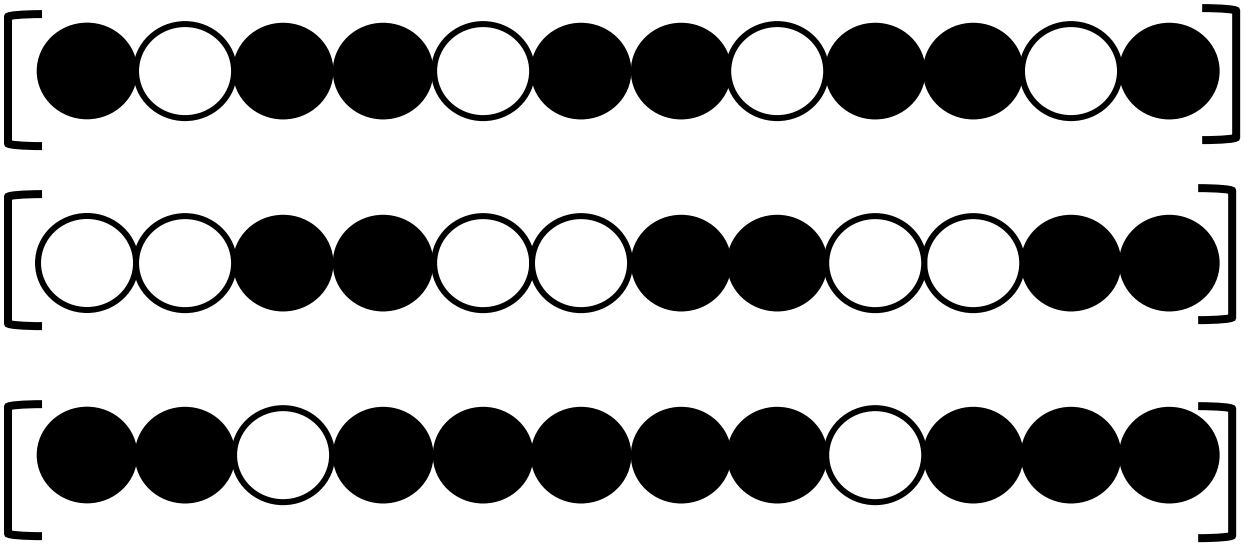
Positive Neutral Negative

3. Choosing the right materials is important and many materials in our world are made of polymers.

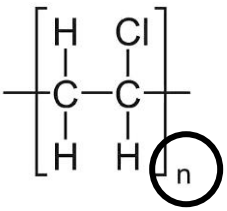
a) What is a polymer and what is a monomer? **[2 marks]**

b) What are the two types of polymers? Please give 1 example for each type of polymer. **[4 marks]**

c) Look at the three polymer chains below.
Please put a circle around a monomer in each of the polymer chains. **[3 marks]**



d) Look at the picture of a PVC polymer below. Why is there an `n` in the picture? **[1 mark]**



4. Fill in the blanks using the words below in the passage about designer polymers. **[6 marks]**

Hydrogen	Sheets	Heavy	Sulfur	Kevlar
Bullet-proof	Flexible	Velcro	Lines	Strong

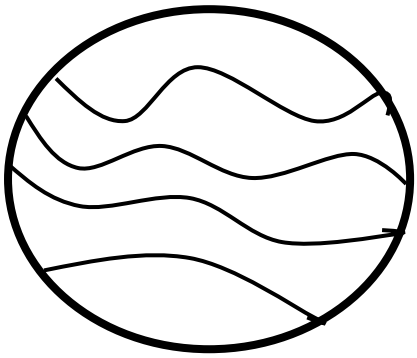
_____vests are made of the designer polymer _____. It is a _____, _____ polymer that is made of long molecules that are linked together in _____. This polymer is strong because it has _____ bonds.

5. Abby is a shoe designer and is trying to make some new shoes with rubber.
   a) The rubber Abby has is too soft. What element can Abby add to the rubber to make it harder? What is this process called? **[2 marks]**

_____

_____

   b) Inside the circle, please draw the changes that will take place if Abby follows the process from 5a). On the line, please write the name of what is being made between the polymer chains. **[2 marks]**



_____

   c) If Abby is successful with the process in 5a) will the shoes have a lower or higher melting point? Please put a circle around the correct answer. **[1 mark]**

Lower Higher

6. a) What is a plasticiser? If I add a plasticiser to PVC, what are 2 new characteristics that the PVC will have? **[3 marks]**

b) Plasticisers are used to make Cling Film (Saran Wrap). Name 1 benefit (good point) and 1 risk (bad thing) of using Cling Film made with plasticisers. **[2 marks].**

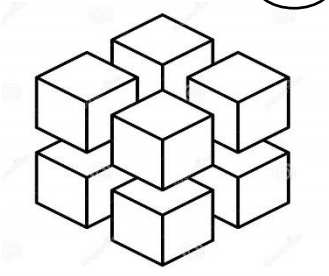
7. David is a scientist who works with nanotechnology.

a) What is the name of the unit of measurement used in nanotechnology? **[1 mark]**

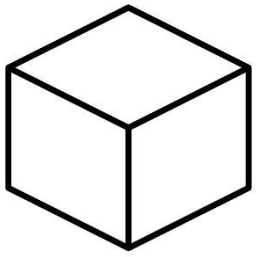
b) How big is the unit of measurement in 7a)? Put a circle around the correct answer. **[1 mark]**

I. 0.00001 m II. 0.001 m III. 0.0000001m IV. 0.000000001 m

c) Look at the two images below, they both represent a nanomaterial. Which one is better for a nanomaterial? Put a circle around the correct answer. **[1 mark]**



A



B

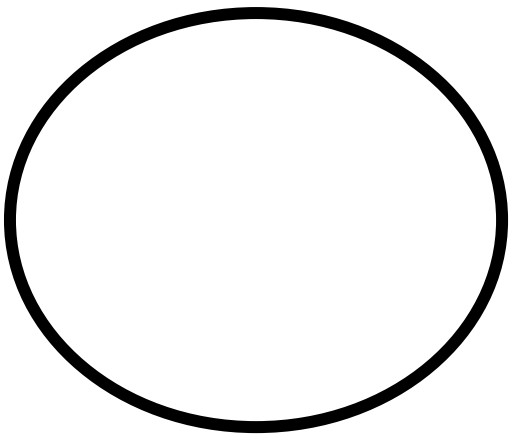
d) Why did you choose your answer from 7c)? Why is it better than the other option? **[2 marks]**

e) Acticoat is a special bandage that uses nanomaterials. What nanomaterial does it use? What are 2 reasons why Acticoat is a good bandage to use? **[3 marks]**

8. Michael has a crayon and a plastic bottle. They are both made of the polymer polythene, but they have different characteristics.
   a) Which item will melt last, the crayon or the plastic bottle? Put a circle around the correct answer. **[1 mark]**

      Crayon Plastic Bottle

   b) In the circle below, please draw what the polymer chains look like in the answer you chose in question 8a). **[1 mark]**



c) Using the picture from 8b), why does this item melt slower than the other item in 8a)? Please explain by comparing this item to the other item`s molecules. **[2 marks]**

End of Exam Paper 😊

PERIODIC TABLE
ELEMENTS 1–20

HYDROGEN 1 **H** 1.01							HELIUM 2 **He** 4.00
LITHIUM 3 **Li** 6.94	BERYLLIUM 4 **Be** 9.01	BORON 5 **B** 10.81	CARBON 6 **C** 12.01	NITROGEN 7 **N** 14.01	OXYGEN 8 **O** 16.00	FLUORINE 9 **F** 19.00	NEON 10 **Ne** 20.18
SODIUM 11 **Na** 22.99	MAGNESIUM 12 **Mg** 24.31	ALUMINUM 13 **Al** 26.98	SILICON 14 **Si** 28.09	PHOSPHORUS 15 **P** 30.97	SULFUR 16 **S** 32.07	CHLORINE 17 **Cl** 35.45	ARGON 18 **Ar** 39.95
POTASSIUM 19 **K** 39.10	CALCIUM 20 **Ca** 40.08						