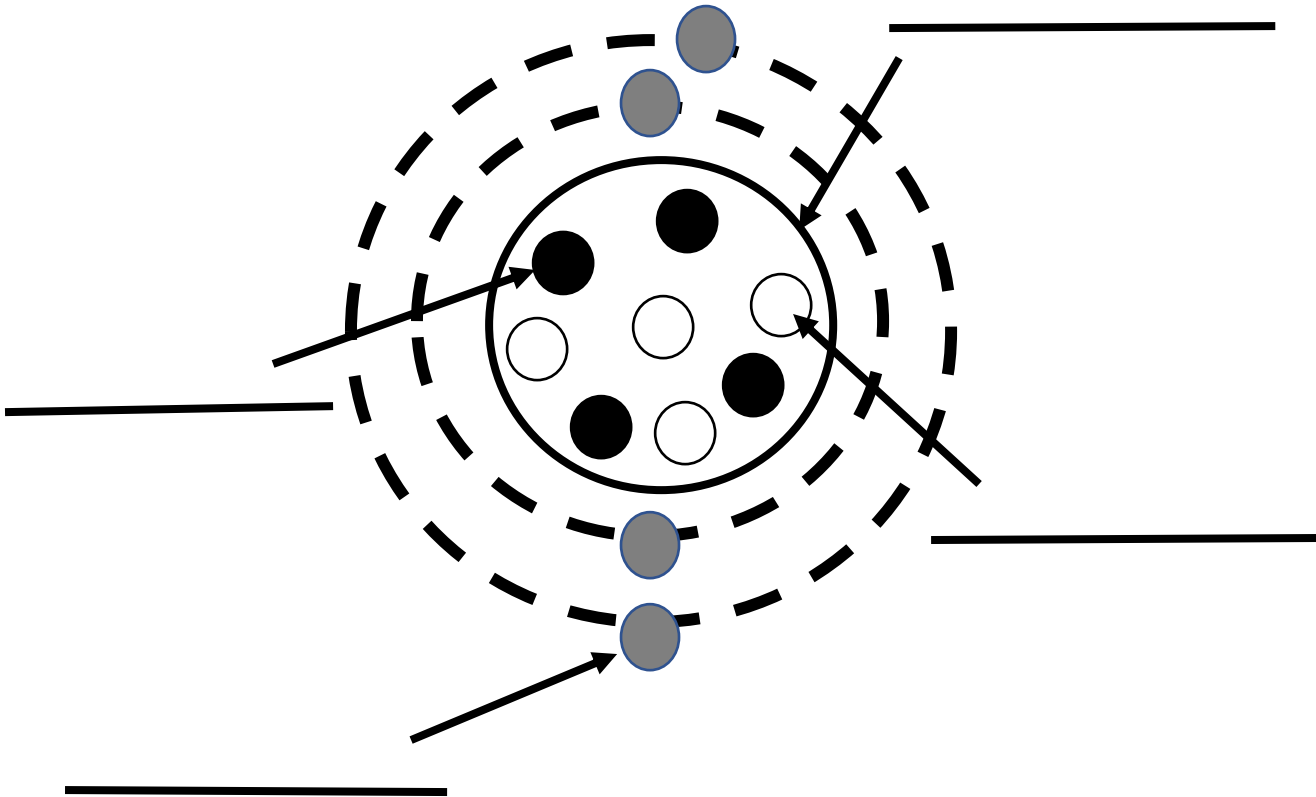


Science English Test Semester 2 2021

Chemistry [____ /50]

Atoms make up everything in the world around us, so it is important to understand them.

1. a) In the diagram below, please label the different parts of the atom and write the charges (if there are charges). [5.5 marks]



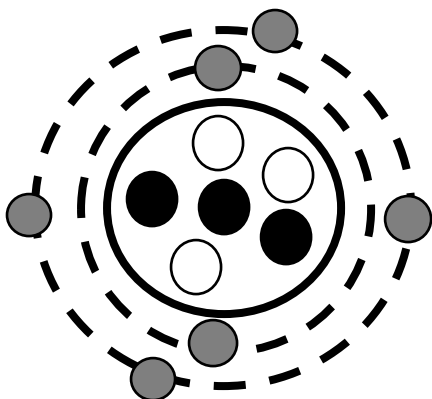
- b) What is the atomic number **and** name of the atom in 1a)? [2 marks]

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

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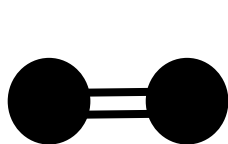
2. a) Look at the atom below, this is a special type of atom. What is the name of this type of atom? Why does it have that name? [2 marks]



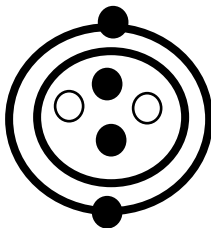
- b) What is the total charge of the atom in 2a)? [1 mark]

3. a) What is a molecule? [1 mark]

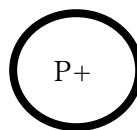
- b) Circle the molecules from the options below. [2 marks]



i



ii



iii



iv

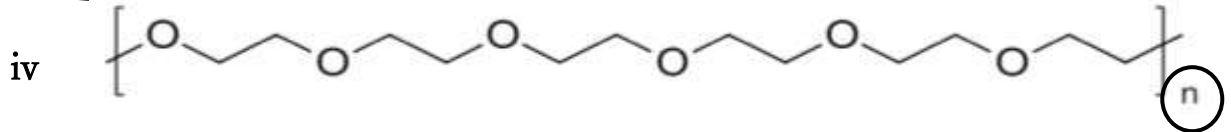
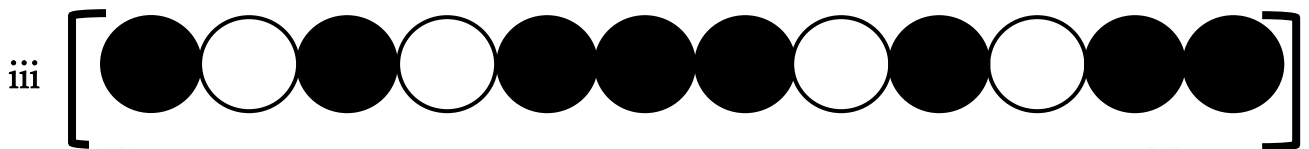
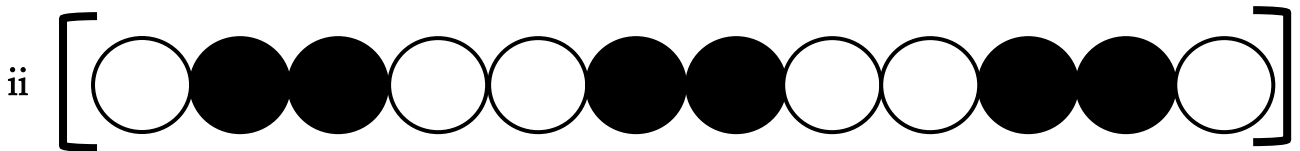
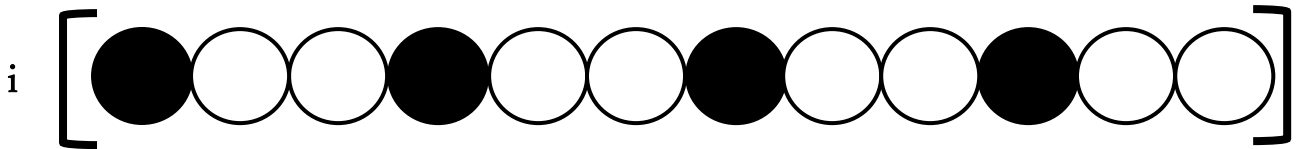
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4. a) What is a polymer and what is a monomer? [2 marks]

b) What is the name of the process that makes a polymer? [1 mark]

c) Circle the monomers in each of the polymer chains below. [4 marks]

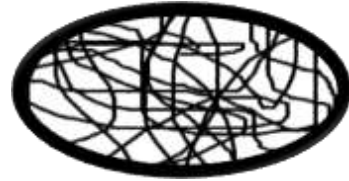
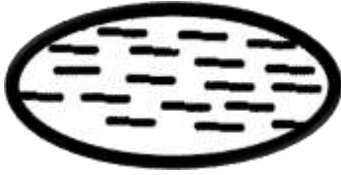


d) In the last polymer (iv), why is there an 'n' at the end of the polymer? What does the 'n' represent? [1 mark]

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5. The pictures below represent the polymer chains of a plastic bottle and a crayon.
- a) On the lines, please write which one is the plastic bottle and which one is the crayon. [0.5 marks]



- b) If both objects were heated up which one would melt first? Put a circle around the answer. [0.5 marks]

Plastic Bottle

Crayon

- c) Explain why you chose the answer from 5b). Why does the object you chose melt faster and why does the other object melt more slowly? [2 marks]

- d) The plastic bottle is made of PET (Polyethylene terephthalate). What **type** of polymer is PET? What is the name of the other type of polymer? What makes the two types of polymers different from each other? [3 marks]

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6. Using the words in the box, fill in the blanks in the paragraph below. (Words can only be used once and some words are not used.) [7 marks]

Velcro	flexible	oily	bad	Cling Film
good	plasticiser	higher	length	lower

Scientists can design polymers by changing their _____ and size. One designer polymer is called _____, it is made with a _____. This is an _____ liquid that sits between the polymer chains that makes the polymer _____ and gives it a _____ melting point. This product is convenient, but it is _____ for the environment.

7. Peter is building a new car, but he needs some help!

a) Peter has some rubber to make the tires for his car, but the rubber is too soft. Which element can he add to make the rubber harder? What is this process called? [2 marks]

b) Does the process from 7a) give the tires a higher or lower melting point? Put a circle around the answer. [0.5 marks]

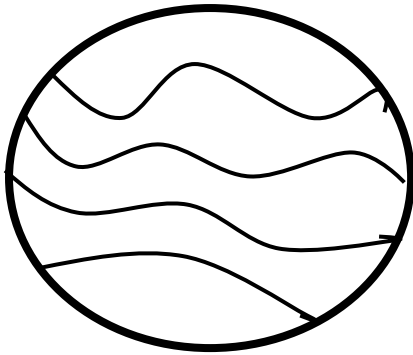
Higher

Lower

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- c) The picture below is a drawing of the polymers in rubber. What does the process from 7a) create between the polymer chains? Please draw them in the picture and write what they are called on the line. [2 marks]



- d) Peter wants to make the car doors bulletproof (防弾). What designer polymer can Peter use to make the doors bulletproof? What type of bond helps this polymer be so strong? [2 marks]

8. Nanotechnology is being used for many products today.

- a) What is the name of the unit of measurement that is used for nanoparticles? [1 mark]

- b) What is the size of the unit of measurement from 8a)? Put a circle around the answer. [0.5 marks]

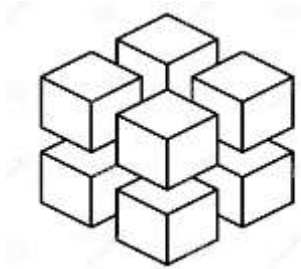
- I. 0.00001 m II. 0.001 m III. 0.0000001 m IV. 0.000000001 m

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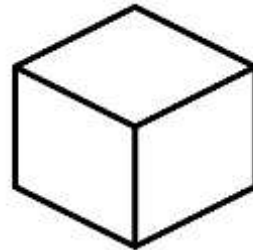
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- c) Silver nanoparticles are used in many items. Name **2 properties/characteristics** that silver nanoparticles have and **2 items** that use silver nanoparticles.
[4 marks]

- d) Both of the images below represent a nanoparticle. Which one is better to use for nanotechnology? Put a circle around your answer. [0.5 marks]



i



ii

- e) Why did you choose the answer from 8d)? Why is your answer better than the other option? [2 marks]

End of Exam Paper 😊

Name:

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Periodic Table of the Elements 1-18							
Hydrogen 1 H							Helium 2 He
Lithium 3 Li	Beryllium 4 Be	Boron 5 B	Carbon 6 C	Nitrogen 7 N	Oxygen 8 O	Fluorine 9 F	Neon 10 Ne
Sodium 11 Na	Magnesium 12 Mg	Aluminum 13 Al	Silicon 14 Si	Phosphorous 15 P	Sulfur 16 S	Chlorine 17 Cl	Argon 18 Ar

If you finish the test early, draw a picture of a cool car from the future!

