- In the space provided, briefly explain the meaning of the following terms.

Marks
2

Intensive properties

- Describe Rutherford's experiment that showed atoms consisted of a concentrated positive charge with a high mass. Make sure you discuss the observations and the conclusions drawn.

2

	Marks
• Direct damage to the DNA of skin cells can be brought about by exposure to ultraviolet radiation of wavelength 300 nm. What are the frequency and energy (in kJ mol^{-1}) of this radiation?	**4**
Frequency:	Energy:

- Direct damage to the DNA of skin cells can be brought about by exposure to ultraviolet radiation of wavelength 300.0 nm. What are the frequency and energy of this radiation?

2

Frequency:	Energy:

THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY

- A cook uses a microwave oven to heat up a meal. The wavelength of the radiation is 0.012 m. Calculate the frequency and energy of a photon of this radiation.

2

Frequency:	Energy:

- Silicon is essential to the computer industry as a major component of chips. It has three naturally occurring isotopes, the relative abundance of each being given below. Calculate the atomic mass of silicon.

2

Isotope	Mass of isotope (a.m.u.)	Relative abundance
^{28}Si	27.9769	92.23%
^{29}Si	28.9765	4.67%
^{30}Si	29.9738	3.10%

Answer:

- A mobile phone sends signals at about 850 MHz (1 MHz = 1×10^6 Hz). What is the wavelength of this radiation?

2

Wavelength =

3

- Complete the entries in the following table.

Element name	Symbol	Mass number	Atomic number	Number of electrons	Number of neutrons	${}^{m}_{z}X$
lithium		7	3			
	Cu			29		${}^{64}_{29}Cu$
aluminium			13		14	