FULL NAME ..... DUE DATE .....

SCIENCE CLASS ..... TEACHER .....

Combined Sciences: Physics Homework/Extension Sheet T14.1

1. What is the coldest temperature possible? Also known as 'absolute zero'

(1 mark)

- ☐ **A:** 0 °C
- ☐ **B:** -100 °C
- ☐ **C:** -273 °C
- ☐ **D:** -293 °C

2. What name is given to the change of state from a solid directly to a gas, skipping the liquid phase?

(1 mark)

- ☐ **A:** Sublimation
- ☐ **B:** Boiling
- ☐ **C:** Condensing
- ☐ **D:** Depressurisation

3. An oven is at 73 °C.
Calculate this temperature in Kelvin.

(1 mark)

- ☐ **A:** 200 K
- ☐ **B:** -200 K
- ☐ **C:** 346 K
- ☐ **D:** 173 K

4. The photograph shows a weather balloon filled with helium.
When released the balloon rises rapidly to a height of 30 000 m above the Earth. Explain how the helium gas exerts a pressure on the balloon.

(3 marks)

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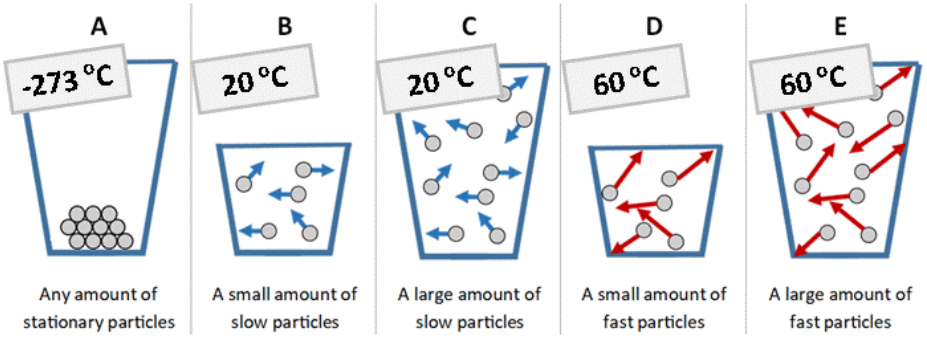
5. The diagrams below show samples of the element argon under different conditions.



State the letters of every sample that matches the descriptions below:

(5 marks)

(a) Has the highest temperature .....

(b) Has a temperature of 333 K .....

(c) Is storing the most energy .....

(d) Particles are experiencing the strongest forces of attraction to each other .....

(e) is at absolute zero .....

You may cut this homework page out if you are not taking your booklet home

	distance travelled = average speed × time	
	acceleration = change in velocity ÷ time taken	$a = \frac{(v-u)}{t}$
	force = mass × acceleration	$F = m \times a$
	weight = mass × gravitational field strength	$W = m \times g$
HT	**momentum = mass × velocity**	$\boldsymbol{p = m \times v}$
	change in gravitational potential energy = mass × gravitational field strength × change in vertical height	$\Delta GPE = m \times g \times \Delta h$
	kinetic energy = 1/2 × mass × (speed)^2	$KE = \frac{1}{2} \times m \times v^2$
	efficiency = $\frac{(\text{useful energy transferred by the device})}{(\text{total energy supplied to the device})}$	
	wave speed = frequency × wavelength	$v = f \times \lambda$
	wave speed = distance ÷ time	$v = \frac{x}{t}$
	work done = force × distance moved in the direction of the force	$E = F \times d$
	power = work done ÷ time taken	$P = \frac{E}{t}$
	energy transferred = charge moved × potential difference	$E = Q \times V$
	charge = current × time	$Q = I \times t$
	potential difference = current × resistance	$V = I \times R$
	power = energy transferred ÷ time taken	$P = \frac{E}{t}$
	electrical power = current × potential difference	$P = I \times V$
	electrical power = (current)^2 × resistance	$P = I^2 \times R$
	density = mass ÷ volume	$\rho = \frac{m}{V}$

	force exerted on a spring = spring constant × extension	$F = k \times x$
	(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance	$v^2 - u^2 = 2 \times a \times x$
HT	**force = change in momentum ÷ time**	$\boldsymbol{F = \frac{(mv - mu)}{t}}$
	energy transferred = current × potential difference × time	$E = I \times V \times t$
HT	**force on a conductor at right angles to a magnetic field carrying a current = magnetic flux density × current × length**	$\boldsymbol{F = B \times I \times l}$
	For transformers with 100% efficiency, potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil	$V_P \times I_P = V_S \times I_S$
	change in thermal energy = mass × specific heat capacity × change in temperature	$\Delta Q = m \times c \times \Delta\theta$
	thermal energy for a change of state = mass × specific latent heat	$Q = m \times L$
	energy transferred in stretching = 0.5 × spring constant × (extension)^2	$E = \frac{1}{2} \times k \times x^2$

Metric prefixes

how to convert		abbreviation	prefix
x 1000 ↓		**T**	tera-
x 1000 ↓		**G**	giga-
x 1000 ↓		**M**	mega-
x 1000 ↓		**k**	kilo-
no prefix			
÷ 1000 ↑		**m**	milli-
÷ 1000 ↑		**µ**	micro-
÷ 1000 ↑		**n**	nano-
÷ 1000 ↑		**p**	pico-

Time

how to convert		abbreviation	Unit of time
x 7 ↓		**wk**	week
x 24 ↓		**d**	day
x 60 ↓		**h or hr**	hour
x 60 ↓		**min**	minute
s, seconds			
÷ 1000 ↑		**ms**	millisecond
÷ 1000 ↑		**µs**	microsecond
÷ 1000 ↑		**ns**	nanosecond
÷ 1000 ↑		**ps**	picosecond