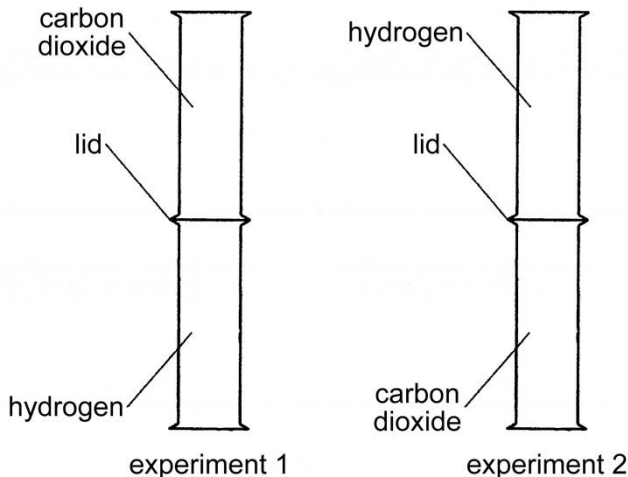




b) **Figure 2** shows the start of an experiment using gas jars of hydrogen and carbon dioxide:



**Figure 2.**

The lids are removed so that the gases are allowed to mix. How will the contents of the gas jars change? Your answer should refer to:

- How the amounts of hydrogen and carbon dioxide change in the gas jars.
- The speed of movement of the gases in each experiment.
- The reasons for each change.

.....

.....

.....

.....

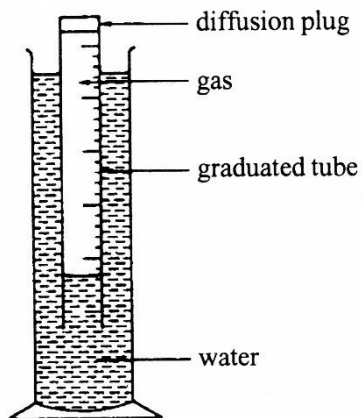
.....

.....

**(4 marks)**

**Question 3:**

**Figure 3** shows the apparatus for measuring the rates of diffusion of gases. The times taken for 100 cm<sup>3</sup> of some gases at room temperature and pressure to diffuse from this apparatus are shown in **Table 1**:



**Figure 3.**

Gas	Time / s
Carbon Monoxide – CO	132
Chlorine – Cl <sub>2</sub>	211
Methane – CH <sub>4</sub>	100
Nitrogen – N <sub>2</sub>	?
Oxygen – O <sub>2</sub>	141

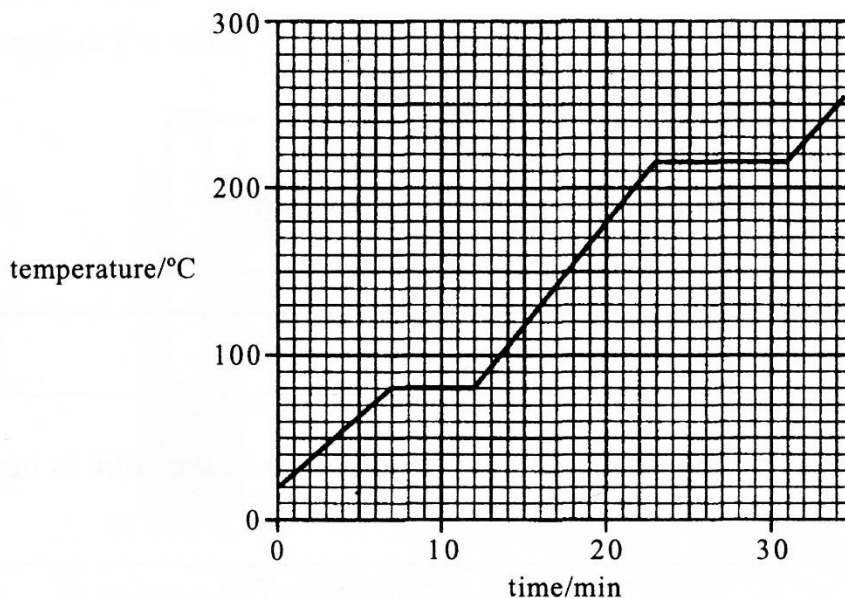
**Table 1.**

- a) Which gas diffuses the fastest?  
.....
- b) Why does this gas diffuse the fastest?  
.....
- c) Suggest the time that 100 cm<sup>3</sup> nitrogen would take to diffuse out from the apparatus.  
.....
- d) Name a gas which will diffuse faster than any of the gases shown in the table.  
.....
- e) Why is this apparatus unsuitable for finding the rate of diffusion of ammonia gas?  
.....  
.....

(5 marks)

**Question 4:**

**Figure 4** shows the heating curve for a pure substance recorded at atmospheric pressure:



**Figure 4.**

- a) What is the melting point of the substance?  
.....
- b) What happens to the temperature while the substance changes state?  
.....
- c) What happens to the force of attraction between the particles while the substance changes state?  
.....
- d) Explain why the substance cannot be water.  
.....

(4 marks)

Periodic Table

The Periodic Table of the Elements

		Group															
I	II	III	IV	V	VI	VII						0					
7 Li lithium 3	9 Be beryllium 4	1 H hydrogen 1	11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10						4 He helium 2			
23 Na sodium 11	24 Mg magnesium 12	13 Al aluminium 13	14 Si silicon 14	15 P phosphorus 15	16 S sulfur 16	32 Cl chlorine 17	35.5 Ar argon 18						40 Ar argon 18				
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	64 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	101 Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	209 Po polonium 84	209 At astatine 85	209 Rn radon 86
87 Fr francium	88 Ra radium	89 Ac actinium															

140 Ce cerium 58	141 Pr praseodymium 59	144 Nd neodymium 60	150 Sm samarium 62	152 Eu europium 63	157 Gd gadolinium 64	159 Tb terbium 65	162 Dy dysprosium 66	165 Ho holmium 67	167 Er erbium 68	169 Tm thulium 69	173 Yb ytterbium 70	175 Lu lutetium 71
232 Th thorium 90	238 Pa protactinium 91	238 U uranium 92	238 Pu plutonium 94	238 Am americium 95	238 Cm curium 96	238 Bk berkelium 97	238 Cf californium 98	238 Es einsteinium 99	238 Fm fermium 100	238 Md mendelevium 101	238 No nobelium 102	238 Lr lawrencium 103

\*58-71 Lanthanoid series  
†90-103 Actinoid series

Key    a    X    b

a = relative atomic mass  
X = atomic symbol  
b = proton (atomic) number

- Scan the QR code below for the answers to this assignment.



[http://www.chemist.sg/kinetic\\_particle\\_theory/assignment\\_kpt\\_ans.pdf](http://www.chemist.sg/kinetic_particle_theory/assignment_kpt_ans.pdf)