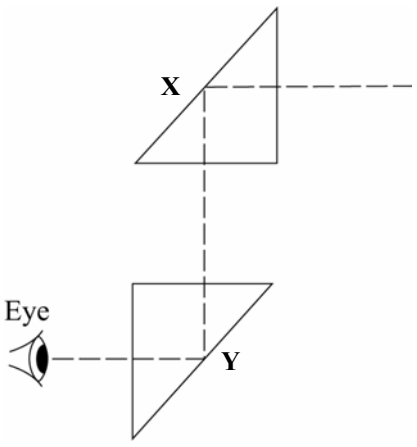
3468/1F Q5

question	answers	extra information	mark
(a)	4		1
(b)	3		1
(c)	3	correct answer with no working = 2 allow 1 mark for f = number ÷ time or correct working i.e., 12 ÷ 4 N.B. correct answer from incorrectly recalled relationship / substitution = 0	2
	Hz / hertz	accept HZ, hz, hZ allow waves / cycles per second allow wps, w/s, cps, c/s	1
total			5

3468/1F Q6

question	answers	extra information	mark
(a)	Quality of written communication: Correct use of 2 of the words, angle, critical, normal and reflection any **two** from • light is reflected / bounces off • if angle between ray and normal / angle of incidence • is greater than critical angle • idea that no refraction / bending if ray at 90 °		1 2
(b)		1 mark for reflection at **X** if ray would reach the lower prism 1 mark for subsequent reflection at **Y** 1 mark for subsequent ray emerging from prism in direction of front of eye accept dotted **or** dashed lines ignore any arrows	1 1 1
total			6

3468/1F Q6

	answers	extra information	mark
(a)	one mark for each ray correctly drawn straight to glass then bent towards pupil	accept both rays hitting any part of eye judge straightness by eye accept dotted **or** dashed lines ignore any arrows N.B. the rays must reach the eye	2
(b)	speed refraction transverse		1 1 1
total			5

3468/1F Q7

	answers	extra information	mark
(a)(i) (ii)	86 222		1 1
(b)	**Quality of written communication** *The answer to this question requires ideas in good English in a sensible order with correct use of scientific terms. Quality of written communication should be considered in crediting points in the mark scheme* Any **three** from radon releases (alpha) radiation (radon **or** radiation causes) harm **or** damage to <u>body</u> **or** <u>cells</u> idea that living near radiation over <u>long period</u> will lead to <u>large 'dose'</u> of radiation radon (is a gas) <u>that can be breathed in</u>	 accept radon is radioactive accept cause cancer /mutations / radiation sickness	 1 1 1
total			5

3468/1F Q15

	answers	extra information	mark
(a)	8 electrons in outer shell negative sign outside bracket	accept anywhere in outer shell accept dots or crosses	1 1
(b)	liquid aqueous	 accept dissolved in <u>water</u> / in solution in <u>water</u>	1 1
(c)(i)	$Cl_2(aq) + \underline{\mathbf{2}}\ KBr(aq) \rightarrow$ $\underline{\mathbf{2}}\ KCl(aq) + Br_2(aq)$	both '2s' needed accept $\frac{1}{2}\ Cl_2$ and $\frac{1}{2}\ Br_2$	1
(ii)	chlorine more reactive *(*than bromine*)*	do **not** credit higher up group allow 'higher up reactivity series' do **not** credit more reactive than an <u>incorrect</u> substance	1
total			6

3468/1F Q16

	answers	extra information	mark
(a)	any two successive peaks labelled **W** half 'height' of wave labelled **A**	accept any 2 points on same part of adjacent waves correct by eye correct by eye N.B. at least one of the answers must be labelled	1 1
(b)	0.2 m/s (unit)	correct answer with no working = 2 allow 1 mark for s = f x w or correct working i.e., 2×0.1 N.B. correct answer from incorrectly recalled relationship = 0 independent mark do **not** allow mps **or** mHz	2 1
total			5

3468/1H Q5

question	answers	extra information	mark
(a)	1:2	accept 0.5:1 reject 2 to 1	1
(b)	gases combine in simple / whole-number ratios / proportions		1
(c)	(Gay-Lussac) twice as much hydrogen as oxygen (formed when water electrolyses)	answer must refer to volumes not just atoms	1
(d)	reference to (shared) electrons / (covalent) bond	reject ionic bonding accept electric forces	1
total			4

3468/1H Q6

question	answers	extra information	mark
(a)(i)	absorbed by water / water heated hot water heats (rest of) food / idea of particle vibration		1 1
(ii)	300 000 000 / 3×10^8	correct answer with no working = 2 allow 1 mark for s = f x w **or** correct working i.e., 10 000 (000 000) × 0.03 N.B. correct answer from incorrectly recalled relationship / substitution = 0	2
(b)(i)	shock waves / seismic waves / earthquake waves	allow **P** waves and / or **S** waves	1
(ii)	seismometer / seismograph		1
total			6

3468/1H Q13

question	answers	extra information	mark
(a)	(ultrasound) waves reflected at boundary / from muscle	accept 'bounce off'	1 1
(b)(i)	time		1
(ii)	speed of (ultrasound) waves		1
total			4

3468/1H Q14

question	answers	extra information	mark
(a)(i)	two protons 2 neutrons	 if neither point gained allow 1 mark for helium nucleus	1 1
(ii)	electron		1
(b)	neutron splits (to form proton and electron)		1
(c)(i)	7 **or** 8 correct data extracted from graph e.g. takes 8 days to drop from 50 to 25	 allow appropriate annotation of graph	1 1
(ii)	long enough to destroy cancer cells but short enough to minimise damage to surrounding tissues	 do not accept dangerous unqualified	1 1
total			8

3468/1H Q18

	answers	extra information	mark
(a)	any **two** from		2
	P *(*waves*)* fast, **S** waves slow	accept faster: comparative needed accept **P** waves arrive before **S**	
	P longitudinal, **S** transverse	both points needed accept suitable description	
	P travel through solids and liquids, **S** only through solids	**P** can go through core, **S** cannot	
(b)(i)	3600 – *4200*		1
(ii)	wave speed changes	accept slow down	1
	wave gets faster (2 marks)		1
total			5

3468/1H Q19

	answers	extra information	mark
(a)	<u>evaporation</u> of sweat	do **not** credit sweating cools body if no reference to evaporation	1
	cools body	allow cools body if attempt at description of evaporation (e.g sweat dries) for 1 mark	1
(b)(i)	idea <u>blood</u> (passing through gut) cooled (by ice)		1
	(this) cooled <u>blood</u> cools brain	do not credit ice cools brain	1
(ii)	**<u>impulses</u>** from brain / thermoregulatory centre to skin	do not accept messages / signals accept hypothalmus accept electrical signals	1
	vessels supplying skin surface capillaries constrict / sweat glands less active or hairs become erect	do **not** credit capillaries constrict / move down accept reduced supply of blood to skin surface shivering (unqualified) is neutral	1
	therefore less heat lost by skin		1
total			7