

2014 OCR Physics B (Gateway) Section D

Q15	Answer from markscheme	Guidance from markscheme	Examiners' report
(a)	1.9(333) (g/cm ³)		This calculation was mostly correct.
(b)	2.7 (g) [2 marks for this]	BUT if answer is incorrect then 0.9 x 3 scores [1]	This calculation was mostly correct.
(c)	Mark explanation only; B is heaviest [0] Unknown liquid is denser than water [1] Unknown liquid is denser than oil [1] and is liquid X [1]	If answer is A then it is still possible to gain up to 2 marks If no clear reference to density of water or oil is made then allow unknown liquid is heavier than oil / water [1]	Most chose beaker B as the response and went on to select liquid X [1]. Better answers also described the unknown liquid as denser than water [1] and oil [1] <i>cumulative</i>
(d)(i)	Oil (linear) reduction in density with increasing temperature / ORA [1]		Most described the density trend and correctly related it to temperature. Some answers omitted temperature completely.
(d)(ii)	Water density rises up to 5° and then falls (nonlinearly) as temperature increases AW [1]	Eg. water's maximum density is at 5°C [1] Allow 3°C - 6°C tolerance	Most answers restricted their descriptions of the graph to the portion after 6°C. This meant they missed out the key points of density rising to a peak at 5 or 6°C and then falling with increased temperature.
(d)(iii)	Any two from: Ice (at 0°C) is less dense (than water at 0°C) [1] Density of water increases up to 5°C [1] (Idea that) water warmer as depth increases [1]	e.g. 'warmest water at the bottom' scores [1]	In this question most stated that ice floated on water as its density is lower than water. Very few realised the water's temperature increased with depth.