Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	an explanation linking any three of the following : use a measuring cylinder /beaker or use a eureka can /displacement can/container with spout (1) (partly) fill measuring cylinder /beaker (with water) note the reading or fill (eureka) can to spout (1) immerse piece of copper (in water) (1) note difference in readings of water level (in measuring cylinder /beaker) or collect water from spout in a measuring cylinder /beaker (1)	give credit for other acceptable methods If no other marks scored then allow 1 mark for attempt to measure volume directly: e.g. fill copper tube with water, tip out and measure volume or measure dimension(s) of copper tube	(3)

Question number	Answer	Additional guidance	Mark
(ii)	recall and substitution (1) density= $\frac{m}{V}$ (density=) $\frac{0.058}{6.5\ (\times 10^{-6})}$ evaluation (1) 8.9×10^{3} (kg/m^3)	 accept values that round to 8900 e.g. 8923(kg/m^3) or 9000 8.9 to any other power of ten gains 1 mark award full marks for correct answer without working.	(2)

Q2.

Question number	Answer	Additional guidance	Mark
	substitution (1) $(r) = \frac{7.22(\times 10^{-2})}{2.69(\times 10^{-5})}$ evaluation (1) (ρ =) 2680 unit (1) kg / m^3	 2.68 to any power of ten seen allow any value that rounds to 2680; e.g. 2684 accept 2700 allow values in standard form e.g. 2.68 x 10^3 kg m^{-3}	**(3)** **AO2**

		allow for three marks: 2.68 to any power of ten **with** a consistent unit, e.g. 2680 kg/m^3 2680 g/dm^3 2.68 g/cm^3 2.68 kg/dm^3 0.00268 kg/cm^3 2 680 000 g/m^3 allow for two marks: • 2680 with no or incorrect unit • 2.68 to any other power of 10 **with** an inconsistent unit of density • correct substitution **with** an inconsistent unit of density allow for one mark: • 2680 to any other power of ten with no or incorrect unit • appropriate unit of density with no or an incorrect value	

Q3.

Question Number	Answer	Additional guidance	Mark
(i)	substitution (1) $(\Delta Q) = 1.5 \times 4200 \times 50$ evaluation (1) 320 000 (J)	 accept 315 000 (J) 310 000 (J) award full marks for the correct answer without working 320 000 000 315 000 000 310 000 000 score 1 mark (mass in grams)	(2)

Question Number	Answer	Additional guidance	Mark
(ii)	substitution (1) $3500 = \frac{670\,000}{t}$ rearrangement (1) $(t=) \frac{670\,000}{3500}$ evaluation (1) 190(s)	accept substitution and rearrangement in either order accept any answer that round to 190(s) power of ten error award 2 marks maximum award full marks for the correct answer without working	(3)

Q4.

Question	Answer	Additional guidance	Mark
(i)	30 (°C) (1)		(1) AO3.1

Question	Answer	Additional guidance	Mark
(ii)	substitution (1) (c =) $\frac{96\,000}{0.82 \times 30}$ evaluation (1) (c =) 3900 (J/kg °C)	allow ECF from (a)(i) throughout allow values that round to 3900 e.g. 3902.4 (J/kg °C) award full marks for the correct answer without working	(2) AO3.1

Q5.

Question number	Answer	Additional guidance	Mark
	volume substitution (1) 1.5 x 1.0 x 0.2(0) (= 0.3) substitution in equation (1) mass = 2100 x (0.3(0)) evaluation (1) = 630 (kg)	 ecf from calculated value of volume for this mark only award 2 marks for 6.3 x any other power of 10 5670 gains 1 mark from use of 1.5+1.0+0.2=2.7 award full marks for correct answer without working	**(3)** **AO2**