This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.
1 (a) (i) 64 (cm$^3$)  
(b) (i) balance / scales  
(ii) find mass using tare / subtract mass of measuring cylinder from that of measuring cylinder + liquid  
(density) = mass/volume  
(c) smaller value for density  

[Total: 6]

2 (a) (i) crocodile clips  
(ii) (close jaws) gently or use ratchet/thimble/spindle or until wheel slips  
repeat at different places/positions (and average)  
(iii) 0.055796 (using π button)/ 0.055768 (using 3.14)/ 0.055818 (using 22/7) 0.056  

(b) (i) axes labelled quantity and unit and axes correct way round  
scales linear, not awkward, start from (0,0)  
points plotted accurately  
best-fit straight line drawn  
(ii) large triangle or any other indication of chosen points shown on graph  
93 ± 2  
accept numbers rounding down to 95 and up to 91  
not accept fractional values  
(iii) candidate’s (a)(iii) ÷ 200 × (b)(ii)  
answer correct (must be checked) in standard form  

[Total: 13]
3  (a) orange, orange  
    brown  
    B1  
    B1  

(b) power supply, fixed resistor and diode (any orientation) in series  
    ammeter in series (with diode and resistor)  
    voltmeter across diode  
    B1  

(c) variable power supply  
    add rheostat/variable resistor  
    add resistor (in series)/use different values of resistor  
    add cells/batteries  
    B1  

(d) reverse power supply  
    reverse diode /it  
    B1  

[Total: 7]  

4  (a) 27  
    B1  

(b) (i) range 100–140  
    range 110–130  
    C1  
    A1  

(ii) \(4 \times \) their (b)(i)  
    B1  

[Total: 4]