

## MARK SCHEME for the October/November 2008 question paper

### 5054 PHYSICS

5054/04

Paper 4 (Alternative to Practical), maximum raw mark 30

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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- 1 (a) 21 cao B1 [1]
- (b) any one of following:  
 allow answer correctly drawn on Fig 1.1  
 scale/ruler placed close to tube  
 eye (level)/sight perpendicular to ruler/scale/reading **NOT** meniscus  
 eye level with reading/meniscus B1 [1]
- (c) axes: correct way round, labelled quantity and unit B1  
 scales: more than  $\frac{1}{2}$  grid, sensible, at least three values B1  
 points: plotted accurately, to  $\frac{1}{2}$  smallest square, maximum size 1 mm dots B1  
 line: best fit, straight neatly drawn with ruler; allow joints first to last points B1 [4]
- (d) pressure not zero when not in liquid/when  $d = 0$  /  
 $p = 3$  to 6 cm water when  $d = 0$  /  
 zero error in reading/measuring pressure /  
 pressure changed when apparatus assembled B1 [1]
- (e)  $d$  increases (equal amounts) as  $p$  increases (by equal amounts) /  
 linear relationship / straight line not through 0,0/positive gradient B1 [1]  
**NOT** directly proportional / doubling  $d$  doubles  $p$  / linearly proportional /  
 $p$  proportional to  $d$
- (f) 18.5 to 19.5 ecf graph B1 [1]  
**NOT** if no line through points drawn on graph

[Total: 9]

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2	(a) line through $OP_1P_2$ with ruler, neat, touching each dot	B1		
	line through $P_3P_4$ with ruler, neat, touching each dot	B1		
	lines produced to meet	B1	[3]	
	(b) repeat for Q	B1	[1]	
	(c) mirror line accurately drawn through intersections	B1	[1]	
	(d) $P_3P_4$ and $Q_3Q_4$ produced back to meet	B1	[1]	
(e) 12.5 to 14.0 cm to nearest mm	unit required	B1	[1]	
(f) pins may not be vertical / pins not straight / where pins enter paper				
	allow more accurate / pins placed correctly or properly	B1	[1]	
			<b>[Total: 8]</b>	
3	(a) reading on scale not zero when closed / no object	B1	[1]	
	(b) 28 seen or implied	C1		
	1.28 seen / 8 seen	C1		
	0.16 cao	unit not required	(0.427 scores 2)	A1 [3]
	(c) easier to use (e.g. no vernier to read/automatic reading) / reduces operator error / quicker to use / more sf or dp or precise	B1	[1]	
	uses a battery / cell / battery / cell may run out / expensive / too sensitive / readings fluctuate / (circuit) malfunction	B1	[1]	
			<b>[Total: 6]</b>	

Page 4	Mark Scheme	Syllabus	Paper
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4	(a) (i) dim(mer than normal) / not lit	B1	[1]
	normal brightness / brighter (than A) / bright	B1	[1]
	(ii) (glows brightly then) blows / filament fuses / melts	M1	
	voltage / current (too) high / more than working value/6V	A1	[2]
	(b) variable resistor / variable power supply / changing number / voltage of cells drawn or described	B1	
	voltmeter across lamp / power supply drawn or described	B1	
	start with low V/high R then measure V just before lamp blows	B1	[3]
	<b>max 2</b> if no circuit drawn showing lamp and power supply / incorrectly drawn symbols / additional incorrectly connected components		

**[Total: 7]**