

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**NOVEMBER 2002**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK : 80**

**SYLLABUS/COMPONENT : 0625/3**

**PHYSICS  
(EXTENDED)**



UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

Page 1	Mark Scheme	Syllabus	Paper
	IGCSE Examinations – November 2002	0625	3

Accept D & E  
marked on time  
axis  
No labels -1

1 a	BD correct, (straight line i.e. constant acceleration) DE correct, (constant speed or slightly reducing speed only) EF correct, (speed reduced to zero, gradient steeper than BD)	B1 B1 3 B1	3
b(i)	force = 2 (N) work = (2 x 0.6) = 1.2 J*	C1 A1	2
(ii)	k.e. = $0.5mv^2$ = $0.5 \times 0.2 \times 2.5 \times 2.5$ = 0.625 J*	C1 C1 3 A1	5
c	velocity - vector, speed scalar direction changes so velocity changes	B1 2 B1	2
d	work done against friction (more) friction on EF (k.e. changed to heat less k.e. changed to p.e.	B1 B1 B1 3 B1	13 * M3
2 a(i)	outline, ruler pivoted (at centre), mass one side, rock other side quality set-up, each mass at (marked) point + labels	C1 2 A1	
(ii)	rod must be balanced before readings can be taken or record mass as 100 g distances to pivot from rock and mass B1 distance pivot to mass B1 mass or 100 x distance to pivot = mass of rock x distance rock to pivot	B1 B2 3 B1	5
b	put water in cylinder, read value insert rock until covered, read value difference in values is volume of rock	B1 B1 2 B1	M2*
c	density = mass/volume or 88/24 = 3.7 g/cm <sup>3</sup> * (accept 3 2/3 g/cm <sup>3</sup> )	C1 2 A1	2 QT 9
3 a	junction of two metals, other ends to meter/alternative arrangements two metals named, meter labelled	C1 2 A1	2
b(i)	meter calibrated in degrees or read value and use calibration chart	B1	
(ii)	change in temp. causes change in voltage/current	2 B1	2
c	high temperatures rapidly changing temperatures (or low thermal capacity) any valid physical reason e.g. distance reading needed, small site etc	B1 B1 2 B1	M2* QT 6
4 a(i)	$L = VIt(m_1 - m_2)$ exact for 2 e.g. $VIt = (m_1 - m_2)L$ only 1 or $m_2 - m_1$	2 C1, A1	
(ii)	= $12 \times 2 \times 3750 / 40$ = 2250 J/g* or $2.25 \times 10^6$ J/kg	C1 2 A1	4
b	(large) intermolecular forces in liquid / bonds (great) energy needed to separate molecules of liquid	B1 2 B1	2 QT 6

Page 2	Mark Scheme	Syllabus	Paper
	IGCSE Examinations – November 2002	0625	3

5 a(i) C marked vertically under/at any peak (including on axis) B1  
R marked on NEXT trough (either way) 1 B1  
(ii) half a wavelength 1 B1 3

b  $f = v/w$  or  $340/1.3$  C1  
 $= 260 \text{ Hz}^*$  2 A1 2  
QT 5

6 a(i)  $43 \pm 1^\circ$  1 A1  
(ii) angle r for this ray is  $90^\circ$  B1  
or marked c → angle c is angle i (in denser medium) (giving angle  $r = 90^\circ$ ) 2 B1 3

b(i)  $3 \times 10^8 \text{ m/s}^*$  1 A1  
(ii) speed in air/speed in medium ~~4~~ M1  
 $= 1.5$  (no up for  $^\circ$ ) 2 A1  
(iii) angle i =  $0^\circ$  / along normal / at  $90^\circ$  to surface 1 B1  
(iv) increased/more/larger 1 B1 5  
QT 8

7 a(i) steel 1 A1  
(ii) insert bar in coil (switch on, leave, switch off) 1 B1  
(iii) to control/measure current or stop circuit/coil overheating 1 B1 3

b(i)  $R = 12/4$  C1  
 $= 3 \text{ ohms}^*$  2 A1  
(ii)  $P = 12 \times 4$  C1  
 $= 48 \text{ W}^*$  2 A1  
(iii)  $E = 48 \times 5$  C1  
 $= 240 \text{ J}^*$  2 A1 6

c(i) 5 (V) 1 A1  
(ii) sum of p.d.'s = circuit supply p.d. C1  
above + detail eg across each component/ in closed circuit etc 2 A1 3  
QT 12

8 a (magnetic field) from left to right/ N to S 1 B1 1

b(i) movement at right angles/between poles, up or down C1  
(vertically) down, stated or reference to arrow on diagram or label 2 A1  
(ii) mention of Fleming's L.H.R. or interacting fields C1  
full explanation leading to correct direction e.g. what fingers show 2 A1 4

c use coil instead of single wire B1  
mount coil on bearings B1  
arrange suitable contacts e.g. slip/slit rings and commutator 2 B1 M2  
QT 7

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE Examinations – November 2002	0625	3

mark on diag	9 a(i) curve upwards between plates		C1	
	curve upwards between plates + straight line	2	A1	
	(ii) top +, bottom -	1	B1	
	(iii) to left, arrow and C marking any point on the beam between X and P	1	B1	4
	b cathode/heater, labelled		B1	
	anode labelled		B1	
	correct arrangement of cathode with anode cylinder		B1	
	suitable power supplies to heater/ anode-cathode (either to score)	4	B1	4
			QT	8
	10 a half-life 4 days*	1	A1	1
	b at least two points worked out		M1*	
	suitable curve completed	2	A1	2
	c by 20 days little radioactivity left, after 1 day about 85% left	1	B1	1
	d ${}^A_ZX \rightarrow {}^0_{-1}e + {}^A_{Z+1}Y$ top line, A1/ bottom line A1	2	A2	2
			QT	6
	or ${}^0_{-1}\beta$ (not e or $\beta$ alone)			
		PAPER TOTAL		80

