UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2006 question paper

0625 PHYSICS

0625/03 Paper 3, maximum raw mark 80

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

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1	**(a)**	point 8,12 identified		B1	
		straight line joining 0,0 and 8,12		B1	
		straight line joining 8,12 and 20,12		B1	**3**
	(b)	acceleration = change in v/change in t or 12/8 etc		C1	
		= 1.5 m/s^2		A1	**2**
	(c)	distance = area under graph between t = 20 and t = 25		C1	
		= 24 m to 28 m		A1	**2**
	(d)	F = ma or 4000 x 1.2		C1	
		= 4800 N		A1	**2**
	(e)	more passengers got on (so mass increased) driver pressed accelerator less (so force decreased) more traffic or going uphill	any two lines	B2	**2**
					[11]
2	any closed triangle or parallelogram			C1	
	forces in correct directions relative to each other			C1	
	correct resultant indicated			C1	
	resultant 7.7 N to 8.1 N			A1	**4**
	scale stated			B1	
	resultant vertically upwards			B1	**2**
					[6]
3	**(a)**	work = force x distance		C1	
		= force of gravity/weight x (vertical) distance/height		A1	**2**
	(b)	**(i)** work = (100 x 8) = 800 J		A1	
				A1	**2**
		(ii) power = (800/5) = 160 W			
		(iii) increases the k.e. of the water (ignore heat/sound)		B1	**1**
					[5]
4	**(a)**	on surface/throughout; no bubbles/bubbles; all temps./b.p.; s.v.p. < at. pressure; svp = at. pressure	any two	B2	**2**
	(b)	energy/work to separate molecules		B1	
		(against) forces of attraction between water molecules (to break bonds C1)		B1	**2**
		The k.e./speed of the molecules does not increase		B1	**1**
	(c)	Wt = mL or 120 x 1 = 0.05 x L		C1	
		L = 120/0.05		C1	
		L = 2400 J/g		A1	**3**
					[8]

5	**(a)**	increase surface area of tank blow air over surface/put in windy place		B1 B1	**2**
	(b)	**(i)**	capillary tube longer or liquid with lower expansivity	B1	
		(ii)	capillary tube thinner/finer or liquid with higher expansivity or bigger bulb	B1	**2**
	(c)	$p_1v_1 = p_2v_2$ or $1 \times 10^5 \times 150 = p_2 \times 50$ $p_2 = 3 \times 10^5$ (Pa)		C1 A1	**2** **[6]**
6	**(a)**	red ray refracted away from normal violet ray refracted more than red ray in prism violet ray further refracted from red ray to screen		B1 B1 B1	**3**
	(b)	$1.52 = \sin 40^o/\sin r$ $\sin r = \sin 40^o/ 1.52$ (= 0.423) $r = 25^o$		M1 C1 A1	**3**
	(c)	**(i)**	3×10^8 m/s	A1	
		(ii)	same as **(i)**	A1	**2** **[8]**
7	**(a)**	Longitudinal or pressure waves		B1	**1**
	(b)	a correct C marked a correct R marked		B1 B1	**2**
	(c)	oscillation/vibration/backwards and forwards along PY (consider pressure waves as alternative)		M1 A1	**2**
	(d)	wavelength = 340/200 PX(= λ/2) = 0.85 m		C1 A1	**2** **[7]**
8	**(a)**	I = W/V or 9/6 I = 1.5 A		C1 A1	**2**
	(b)	**(i)**	8 ohm	A1	
		(ii)	6 V	A1	**2**
	(c)	**(i)**	brightness decreases/dimmer	B1	
		(ii)	resistance of circuit greater current through lamp falls	B1 B1	**3**
	(d)	**(i)**	4 ohm	A1	
		(ii)	4 ohm	A1	**2** **[9]**

9	**(a)**	primary and secondary coils on iron core labelled			B1	
		240 V a.c. to primary, 12 V a.c. to secondary			B1	
		turns ratio shown or stated 20:1, stepdown			B1	**3**
	(b)	**(i)**	must be constantly changing magnetic field		B1	
		(ii)	magnetic field of primary passes through core to secondary		B1	
			magnetic field of secondary cuts coil, induces output		B1	**3**
	(c)	**(i)**	18 W		A1	
		(ii)	540 J		A1	**2**
						[8]
10	**(a)**	bring rod close but not touching plate			M1	
		touch metal plate with earth lead			M1	
		remove lead and then rod			A1	**3**
	(b)	**(i)**	Q = 20 (mA) x 15 (s)		C1	
			= 0.30 C		A1	
		(ii)	V = 20 (ma) x 10 (kΩ)		C1	
			= 200 V		A1	**M3**
						[6]
11	line1	into paper			B1	
		positive or +2			B1	
	line 2	out of paper or opposite of line 1			B1	
		negative or -1			B1	
	line 3	no deflection			B1	
		no charge			B1	**6**
						[6]