edexcel

Mark Scheme (Results)

June 2011

International GCSE
Physics (4PH0) Paper 1P
Science Double Award (4SC0) Paper 1P

INTERNATIONAL GCSE PHYSICS 4PH0/1P – SUMMER 2011

ecf - error carried forward
dop - dependent on previous
ora - or reverse argument
owtte - or words to that effect

Question number	Answer	Notes	Marks
1 (a) (i)	gravitational		1
(ii)	elastic		1
(iii)	kinetic		1
(b) (i)	bounces lower / less / smaller / shorter / not as high (each bounce)	ACCEPT: refs to diagram e.g. "loops / dotted lines less tall" ACCEPT: distance between bounces gets smaller	1
(ii)	(transferred away to) thermal energy	ACCEPT: heat / sound REJECT: other forms of energy e.g. light / chemical ACCEPT: refs to where the energy goes e.g. "to the air", "to the ground", "to the surroundings" IGNORE: friction	1

Total 5 Marks

Question number	Answer	Accept	Reject	Marks
7 (a)	B			1
(b)	Any **two** of Energy transfer from supply / electrical energy; Energy transfer to thermal energy (heat) / particle vibration; There is a current (in the heating element); Heating effect of resistance /a resistor;	Electrical → thermal /heat for 2 marks IGNORE: electricity		2
(c) (i)	Power = current x voltage;	Or equivalent, e.g. Power = voltage x current Voltage = power ÷ current Current = power ÷ voltage P= I x V If (i) is blank, but correct equation written in (ii), then credit.	equation “triangles”	1
(ii)	Substitution 2000 / 230; Calculation 8.7 (A);	ACCEPT: 8.69 (A)		2
(iii)	13 A; Only one above working current; dop	OWTTE ORA e.g the others would blow		2

Total 8 marks

Question number	Answer	Accept	Reject	Marks
8 (a) (i)	(average) speed = distance / time;	Or equivalent – distance = speed x time, time = distance ÷ speed, or correct symbols e.g. v = d / t If (i) is blank, but correct equation written in (ii), then credit.		1
(ii)	Substitution 9000 / 900; Calculation 10; Unit m/s;	ACCEPT: e.g. 9/15 = 0.6 km/minute 9/0.25 = 36 km/hour 9000/15 = 600 m/min 9/900 = 0.01 km/s i.e. any unit that is consistent with the number		2 1
(iii)	Any **two** from: speed not constant ; OWTTE slow at (some) points / stations ; fast at (other) points / between stations ;	ACCEPT: this idea implied e.g slower (1) at stations (1)		2

Question number	Answer	Notes	Marks
11 (a)	Mass of cylinder + unit = 325 ; Mass of cylinder = 106 ; Mass of liquid in cylinder = 219 ; Volume of liquid = 176 ; Mass unit: g ; Volume unit: cm^3 / ml ;	 ACCEPT: ecf on M1 and M2 ACCEPT: either unit used appropriately at least once	6
(b)	Any **two** from: equation; correct substitution made or correct mass indicated; density = between 1.24 and 1.25; density unit (g/cm^3 OR g/ml);	 ecf from 11(a) Correct and consistent alternative e.g. 1240 kg/m^3 1.24 kg/dm^3	2
(c)	Any **two** from: more sensitive equipment ; check balance zero ; calibrate any equipment ; avoid parallax when reading measuring cylinder / bottom of meniscus ; use larger volume of liquid ;	 ACCEPT: measure to more dp / use burette IGNORE: repeat experiment IGNORE: refs to “use more accurate…”	2

Total 10 marks

Question number	Answer	Notes	Marks
12			4
M1	pressure greater in the full cup / less in the half-full cup ;		
M2	reference to equation / p = W ÷ A / p = h x ρ x g ;	ACCEPT: F in place of W	
M3	{depth / mass / weight} of liquid / force different in each cup ;	IGNORE: amount of coffee different	
M4	density / g / area the same for each cup ;		

Total 4 marks

Question number	Answer	Notes	Marks
13 (a) (i)	77		1
(ii)	115		1
(b)	(nuclei with) same number of protons / same atomic number / same element ; different numbers of {neutrons / nucleons} / different mass number;	ACCEPT: atoms / elements for nuclei REJECT: molecules / substances for nuclei IGNORE: electrons	2
(c)	192; 78;		2
(d)	alpha not penetrating enough (of the tumour) / ionises before reaching whole tumour ; gamma too penetrating / travels straight through /too weakly ionising / OWTTE ; beta will penetrate the tumour but no further / stays in tumour and doesn't affect horse / ionises within tumour (but no further) / OWTTE ;	IGNORE: doesn't penetrate skin IGNORE: bald 'weak' or 'strong' IGNORE: general properties of alpha, beta and gamma	3
(e) (i)	C		1
(ii)	activity decreases over time ; relate activity to situation e.g. C remains sufficiently active (over the treatment) / A and B not effective over period of treatment / A and B would need source to be replaced / D continues to be radioactive / cause damage (after treatment) ;	ACCEPT: calculation of period of activity IGNORE: bald 'weak' or 'strong'	2

Total 12 marks