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Mark Scheme (Results)

January 2012

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

PEARSON

INTERNATIONAL GCSE PHYSICS 4PH0 4SC0 /1P – JANUARY 2012

Question number			Answer	Notes	Marks
1	(a)	(i)	A		1
		(ii)	B		1
	(b)	(i)	C		1
		(ii)	nearest above (DOP)		1
		(iii)	Comment on device – (plastic) insulator / does not conduct;	(double) insulated / no current (through) / cannot become live	1 1
			Comment on user - no risk of shock / electrocution;	No electricity reaches user / person cannot touch live parts	

Question number			Answer	Notes	Marks
8	(a)	(i)	voltage = current x resistance	ACCEPT equivalent rearrangement ACCEPT suitable abbreviations e.g. V = I x R REJECT V = I x REJECT equation 'triangles' alone	1
		(ii)	1.2 x 4.0; 4.8 (V);		2
		(iii)	12 – 4.8; 7.2 (V);	ECF on (ii)	2
		(iv)	E = VIt (NO MARK) time conversion to seconds (5.0 x 60); 7.2 x 1.2 x (5.0 x 60); 2600 (J);	ECF on (iii) Allow 2592 or 2590 ALLOW 2500/2520 (J) for full marks (using 7 V) ALLOW 42 (J) or 43.2 (J) for 2 marks (using 5 mins)	3
		(v)	idea of energy losses rate of energy loss = rate of energy supply (at steady temp)	NB this statement alone scores (2) as it includes idea of energy loss	2

Question number		Answer	Notes	Marks
9 (a)		gravity		1
(b)	(i)	6960 (km)		1
	(ii)	equation quoted (NO MARK) conversion of km OR min; v = (2 x π x 6 960 000) / (96 x 60); 7600;	ECF on (i) Allow for rounding errors	3
(c)		EITHER grav pe reduces when closer; (so) ke increases; because total energy conserved; OR gravitational attraction / field strength increases when closer; mass remains constant; so accelerates;	Grav force increases so ke increases = 1 (mixing arguments) REJECT 'gravity higher' 'gravity stronger' ACCEPT 'pull of gravity' 'force of gravity'	3
(d)	(i)	electromagnetic (spectrum)	Accept transverse (waves)	1
	(ii)	Any **two** from X-rays have shorter wavelength; ORA X-rays have higher frequency; ORA X-rays have higher energy; ORA X-rays have greater penetration range; ORA X-rays have greater effects on living tissue; ORA	Idea of comparison must be there REJECT 'visible light can be seen' / eq	2

Question number			Answer	Notes	Marks
10	(a)	(i)	GPE = mass x g x height	ACCEPT equivalent rearrangement ACCEPT suitable abbreviations e.g. GPE = mgh ACCEPT 'gravity' or 'gravitional field strength' or 'acceleration due to gravity' for g	1
		(ii)	78 x 10 x 5; 3900 (J);		2
		(iii)	3900; J / joule;	Accept 4000 J REJECT 'Nm' for 'J' ALLOW kJ only if it matches the value (i.e. 3.9)	2
	(b)	(i)	efficiency = useful energy output / total energy input	ALLOW 'power' for 'energy'	1

		(ii)	in one second –
			useful energy out = (30 x 3900) / 60;
			efficiency = 1950 / 7500;
			0.26 / 26%
				Allow
				useful energy out = (30 x 4000) / 60;
				efficiency = 2000 / 7500;
				0.27 / 27%
				
				CQ on a(ii)
					3

	(c)		right general shape reasonably correct proportions / 3kW and 12 kW seen correctly labelled	ACCEPT "input / waste / useful" or "electrical / kinetic or GPE / waste heat or sound"	3