Mark Scheme (Results)

Summer 2018

Pearson Edexcel International GCSE
In Physics (4PH0) Paper 1PR

Question number	Answer	Notes	Marks
8 (a) (i)	(unbalanced) force = mass × acceleration;	allow in standard symbols and rearrangements e.g. F = m × a	1
(ii)	substitution; evaluation; e.g. (F =) 7.9 × 0.87 (F =) 6.9 (N)	-1 for POT error e.g. changing kg to g allow 7, 6.87, 6.873 (N)	2
(iii)	to oppose its movement / to the left;	allow backwards	1
(iv)	any two from: **between** {wheels / trolley} and bench; **between** string and pulley; drag/air resistance (on the front of trolley / falling mass); the axle(s) (of the trolley / pulley);	allow table/floor/ground for bench allow tyres for wheels	2
(b) (i)	GPE = mass x *g* x height;	allow in standard symbols and rearrangements e.g. GPE = m × *g* × h reject 'gravity' for *g*	1
(ii)	substitution; evaluation; e.g. (GPE =) 5 × 10 × 0.65 (GPE =) 33 (J)	allow *g* = 9.8 / 9.81 (N/kg) -1 for POT error e.g. changing kg to g allow 31.85, 31.89, 31.9, 32, 32.5 (J)	2
(iii)	33 (J) / same answer as in (b)(ii);		1

Total for question 8 = 10 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>9 (a)</td><td>dimensionally correct substitution;
rearrangement;
evaluation of period in seconds;
period in minutes;

e.g.
$7.5 = \frac{2 \times \pi \times (780 + 6\,371)}{T}$
$(T =) \frac{2 \times \pi \times (780 + 6\,371)}{7.5}$
(T =) 5 991 (s)
(T =) 99.85 (mins)</td><td>no mark for equation as given

if R_E or height used instead of orbital radius then 3 marks max

allow range of 99-100 (mins)
10.89… , 88.9…gets 3 marks
653.45… , 5337… gets 2 marks</td><td>4</td></tr>
<tr><td>(b)</td><td>(number of revolutions = 24 × 60 / 99.8) = 14.42;</td><td>allow ECF from (a)
allow 14, 14.4</td><td>1</td></tr>
<tr><td>(c)</td><td><table><tr><th>Statements</th><th>Tick</th></tr><tr><td>the higher the speed, the lower the height of the satellite</td><td>✓</td></tr><tr><td>a greater period means that the satellite has a greater speed</td><td></td></tr><tr><td>satellites that orbit higher make more revolutions per day</td><td></td></tr><tr><td>lower height satellites have shorter periods</td><td>✓</td></tr><tr><td>satellites with a higher speed make fewer revolutions per day</td><td></td></tr><tr><td>the higher the number of revolutions per day, the shorter the period</td><td>✓</td></tr></table>
1 mark for each correct tick;;;
if more than three ticked, then -1 for each additional tick</td><td></td><td>3</td></tr>
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Total for question 9 = 8 marks