Your Science Online

Cambridge IGCSE Physics 0625 style

FORCES – MARK SCHEME

Maximum mark: 45 (Core: 29). ";" separates marking points. Accept correct alternative wording. Apply error carried forward (ecf) where shown. Do not award a final-answer mark if the unit is wrong or missing, unless the unit is printed on the answer line.

Question	Answer	Marks	Guidance
1(a)	to avoid parallax (error);	1	allow: so the reading is accurate / not too high or too low
1(b)	6.0 (cm);	1	allow 6
1(c)	all points plotted correctly; to within ½ small square; straight line through origin for 0–4.0 N; line curving upwards above 4.0 N (or best-fit line not forced through last two points);	3	B1 points (all 7, ecf from (b)); B1 straight-line section; B1 curve or line ends at about 4 N do not allow: dot-to-dot zig-zag
1(d)	4.0 N;	1	allow 4.0–4.5 N
1(e)	k = F / x **or** 4.0 / 0.080; 50 (N/m);	2	any correct pair from straight part, e.g. 2.0 / 0.040 0.5 N/cm or 50 N/m for 2 marks if unit correct do not allow: x in cm with answer 0.5 N/m
2(a)	120 - 80 = 40 (N); to the right / in the direction of the push;	2	do not allow: 200 N (adding forces)
2(b)	a = F / m **or** 40 / 20; 2.0 (m/s²);	2	ecf from (a)
2(c)	moves at constant speed / velocity (in a straight line); resultant force is zero / forces are balanced;	2	do not allow: "the box stops" (0 marks for description) reason mark can be scored alone
2(d)	only friction acts / resultant force is backwards (opposite to the motion); box decelerates (until it stops);	2	allow: friction acts against the motion; so negative acceleration
3(a)	force × perpendicular distance (from the pivot);	1	do not allow: force × distance (perpendicular needed)
3(b)	400 × 1.5; 600 (N m);	2	
3(c)	clockwise moment = anticlockwise moment **or** 300 × x = 600; x = 600 / 300; 2.0 (m);	3	ecf from (b) correct answer with no working: 3 marks

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Question	Answer	Marks	Guidance
3(d)	no resultant force; no resultant moment / turning effect;	2	allow: forces balanced; moments balanced (either order)
4(a)	point through which all the weight (of the object) appears to act;	1	allow: where the mass seems to be concentrated
4(b)	B; lower centre of gravity **and/or** wider base; must be tilted further before the weight (line of action) acts outside the base;	2	B alone scores 0 any two marking points for 2 marks; the choice B must be correct to score
4(c)	hang card freely from a pin through a hole (near the edge); hang a plumb line from the same pin; draw a line on the card along the plumb line; repeat from a second hole: centre of gravity is where the lines cross;	4	marks can be scored from a labelled diagram allow: check with a third hole
5(a)	p = mv **or** 2.0 × 3.0; 6.0 kg m/s;	2	allow N s
5(b)	momentum is conserved / total momentum after = 6.0 kg m/s; (2.0 + 1.0) × v = 6.0; 2.0 (m/s);	3	ecf from (a) do not allow: 3.0 m/s (mass of A only)
5(c)	impulse = change in momentum of B = 1.0 × 2.0 = 2.0 N s; F = impulse / time **or** 2.0 / 0.15; 13 (N);	3	ecf from (b) allow 13.3 N; allow 2 significant figures or more
6(a)	arrow from ball pointing towards the centre of the circle;	1	arrow along the string, towards the centre
6(b)	direction (of motion) is changing; so velocity is changing (velocity is a vector);	2	do not allow: “speed is changing”
6(c)(i)	increases;	1	
6(c)(ii)	decreases;	1	
6(c)(iii)	increases;	1	

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