Forces

Mark Scheme 7

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	General Physics
Sub-Topic	Forces
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 7

Time Allowed: **59 minutes**

Score: **/49**

Percentage: **/100**

1 **(a) (i)** 1.6s to 1.8s ALLOW 4.2 – 6s ALLOW 4.4 – 6s NOT 2s NOT 4.0 – 6s B1

(ii) 6 – his **(i)**, evaluated ALLOW 0 – 4.2s ALLOW 0 – 4.4s NOT 0 – 4s e.c.f. B1

(iii) his **(i)** × 20 C1
32 – 36m or his **(i)** × 20 evaluated
allow B1 only for 40m with no working A1

(iv) area under whole graph or ½vt + his**(iii)** C1
70 – 95m A1

(b) (i) weight of ball down and (air) resistance up
OR friction opposes weight)
upward/resistance/friction force increases
with time/distance/speed/as ball falls) any 3 B1×3
net force reduces)
less force, so less acceleration)

(ii) up force = down force OR no resultant force OR air res. = weight B1
no net force, no acceleration/constant speed B1

[Total: 11]

2

	(a)	acceleration, speed increases	B1	
		acceleration getting less	B1	
		acc. zero/constant speed along RT or terminal velocity	B1	**3**
	(b)	air resistance or friction (force) up (accept upthrust)	B1	
		weight/(force of) gravity down	B1	**2**
	(c)	air resistance (up) = weight (down) or two forces equal	B1	
		no (net) force, no acceleration	B1	**2**
	(d)	distance = speed x time or 120 x 40	C1	
		distance = 4800 m	A1	
	(ii)	distance = average speed x time or 25 x 6 or area under graph	C1	
		distance = 150 m	A1	**4**
				[11]

3	**(a)**	time a number of swings (if number stated, >5) time divided by [2 x number of swings]	M1 A1	**2**
	(b)	weight of gravity and tension	B1	
	(ii)	force towards centre of circular motion or towards support point	B1	**2**
	(c)	p.e. = mgh or 0.2 x 10 x 0. = 0.1 J	C1 A1	**2** **[6]**

4	**(a)**	force of gravity on a mass or mg mass/volume	**B1** **B1**	**[2]**
	(b) (i)	hang object from spring balance, reading in N taken divide reading in N by 10 or g	**B1** **B1**	
	(iii)	volume of water in cylinder or fill overflow can to top add object find increase in volume or measure overflow volume {no credit for mass unless not scored in (i) and no credit for density = mass/ volume unless not scored in a) }	**B1** **B1**	**[4]**
	(c)	2N left	**B1** **B1**	
	(ii)	F = ma or 2 = 0.5 a a = 4.0 m/s^2	**C1** **A1**	**[4]** **Total [10]**

5	**(a) (i)**	7(.0 s)	**A1**	
	(ii)	PQ or 0 – 2s or other correct description	**A1**	
		distance = av. speed x time or area under graph	**C1**	
		distance 11 x 2 m= 22 m	**A1**	**4**
	(b) (i)	deceleration (now) uniform (test 2)	**B1**	
		slower/lower (average) value/value between that of PQ and QR/takes longer (or values) time to come to rest.	**B1**	
	(ii)	deceleration = change in speed/time or 15/8	**C1**	
		value = 1.9 m/s^2	**A1**	**4**
	(c) (i)	graph shows constant acceleration	**B1**	
		force = ma (and m is also constant) so force is constant	**B1**	
	(ii)	towards the centre of the motion/circle	**A1**	
				[11]